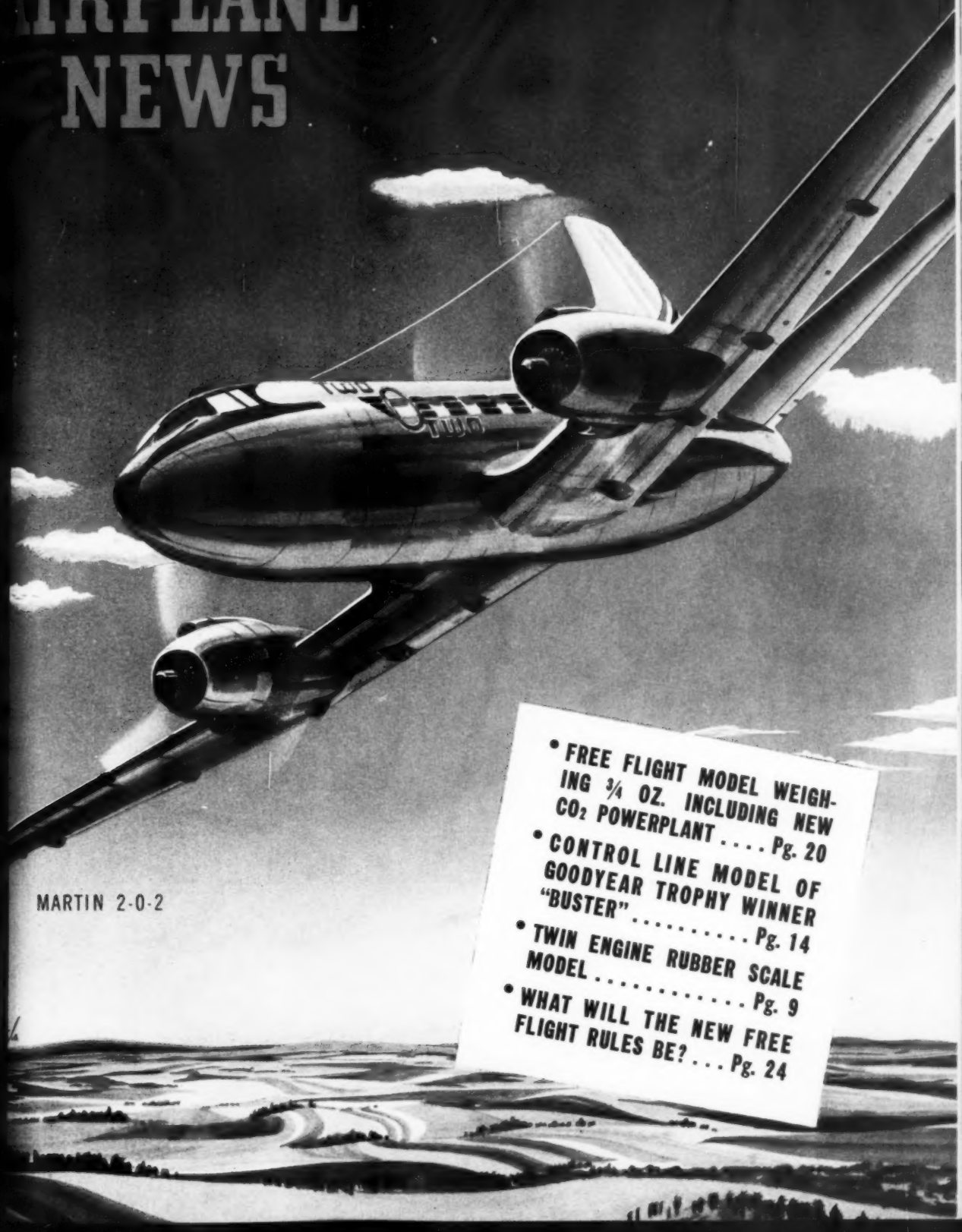
MODEL AIRPLANE NEWS

DECEMBER 1947 · 25 CENTS



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DECEMBER 1947 VOL. XXXVII No. 6

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RELEASE of three new Air Force combat planes points towards the ever nearing jet-sonic air force for the U.S.A., which is the top level plan with a 1950 target date. Outstanding in lineup is the impressive Boeing XB-47 swept wing bomber, a truly "Buck Rogers" creation out of the 25th Century. Actually its lines are far more futuristic than any comic drawings for its swept wing and tail, and its odd underslung nacelles stamp it as the epitome of a "Design Forum" contributor's dream. But each of those radical lines represents a hard engineering fact stamped indelibly by research and scientific design. The sweep of the wing moved the wing center of lift rearward with the necessity for moving forward as much of the weight of fixed items as possible. As a result, the main engine installation had to be placed forward of the wing leading edge and suspended beneath it to provide a clear path for the jet efflux. Since the wing structure could not handle the additional torsional load of another engine on each cantilever support, the other two engines were placed out near the wingtips, a point indicated by wind tunnel tests as the least drag-producing. The six engines of XB-47 produce well over 24,000 hp at 375 mph. The spacious bomb bay can carry 20,000 lbs. of bombs including the atomic bomb. Only armament is a .50 cal. machine gun turret in extreme tail, which Air Force tacticians believe is all the defensive armament the 600 mph bomber will need. An additional feature of the XB-47 is a battery of 18 rocket motors used for JATO and bursts of power at high speed. These units provide an additional 18,000 hp at 375 mph.

SECOND SWEPT WING craft in AF stable is the long awaited North American XP-86, an AF version of the fast Navy XFJ-1. The XP-86, however, differs from the Navy prototype in the use of swept wings, which necessitated an extension of the fuselage to provide the required directional control. The new fighter is powered by a General Electric J-35 turbojet engine and has a top speed of well over 600 mph. It has a span and a length of 38 ft. and weighs more than 12,000 lbs. It can climb to 40,000 ft. and is powered by six .50 cal. machine guns mounted around air intake in the nose.

THE CURTISS XP-87 uses brute power to accomplish what the XP-86 does by finesse: speed. This two man "all weather" fighter is powered by four Westinghouse 24C engines producing 12,000 lbs. thrust and giving the giant craft a 600 mph top speed. The crew is seated side-by-side and equipped with radar operated and controlled navigational and armament equipment comprising its "all weather" operational capabilities. The big fighter has

(*Turn to page 74*)

(Above) Martin XB-48, first army six jet bomber, powered by GE-Allison J-35 engines. The new tandem landing gear is used, and the ship carries a crew of 3 and over 10 tons of bombs. (Below) A two-man crew operates this Curtiss P-87 fighter. Four jets are used and wingspan is 65 ft.

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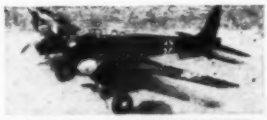

M E 210 German **MESSERSCHMITT**

AVRO LANCASTER... Early type.
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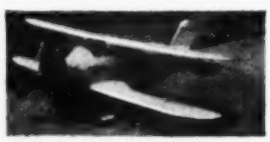

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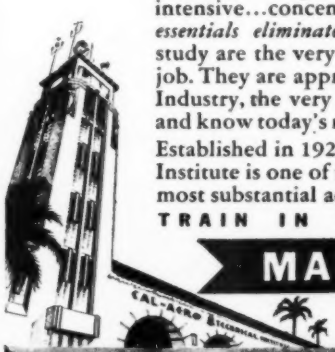

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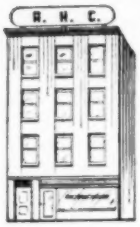

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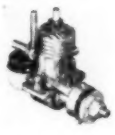

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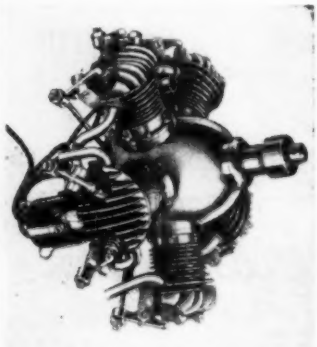

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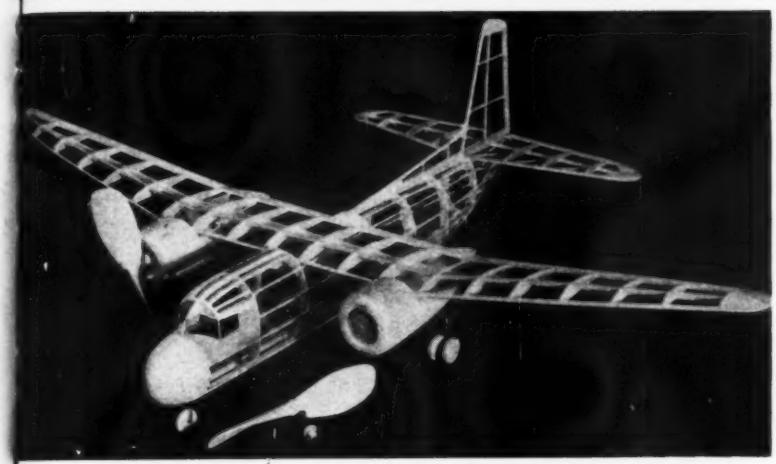
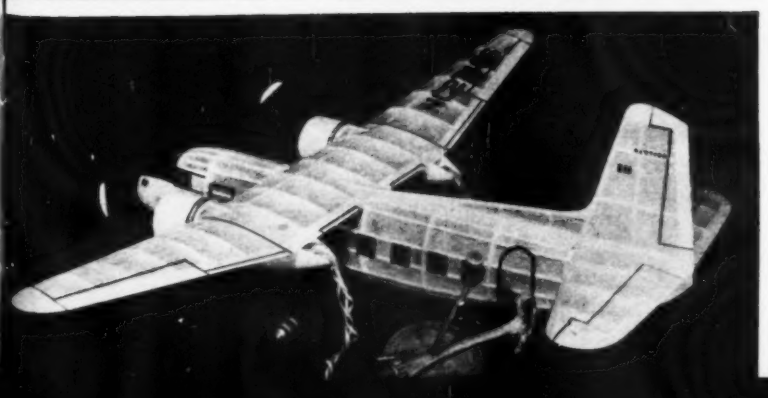




LOCKHEED SATURN

by S. RICHARD STRUHL

Somewhat off the beaten path but still a fine performer

WE present this month a most unusual rubber powered flying scale model—the Lockheed *Saturn*, which lends itself admirably for this type of model. The force arrangements and setup are almost perfect for stable flight, and the engine nacelle and stabilizer location provide just the proper amount of down thrust.

But a word about the "big job" before we get into the model; the *Saturn* was designed as either a short haul or feeder line passenger-cargo transport. It also lends itself nicely as a corporation personnel transport. The ship is powered by two 525 hp engines and has a top speed of over 240 mph carrying 14 passengers and baggage. The extreme simplicity of operation has kept the operating cost per mile very low. Crew consists of two men.

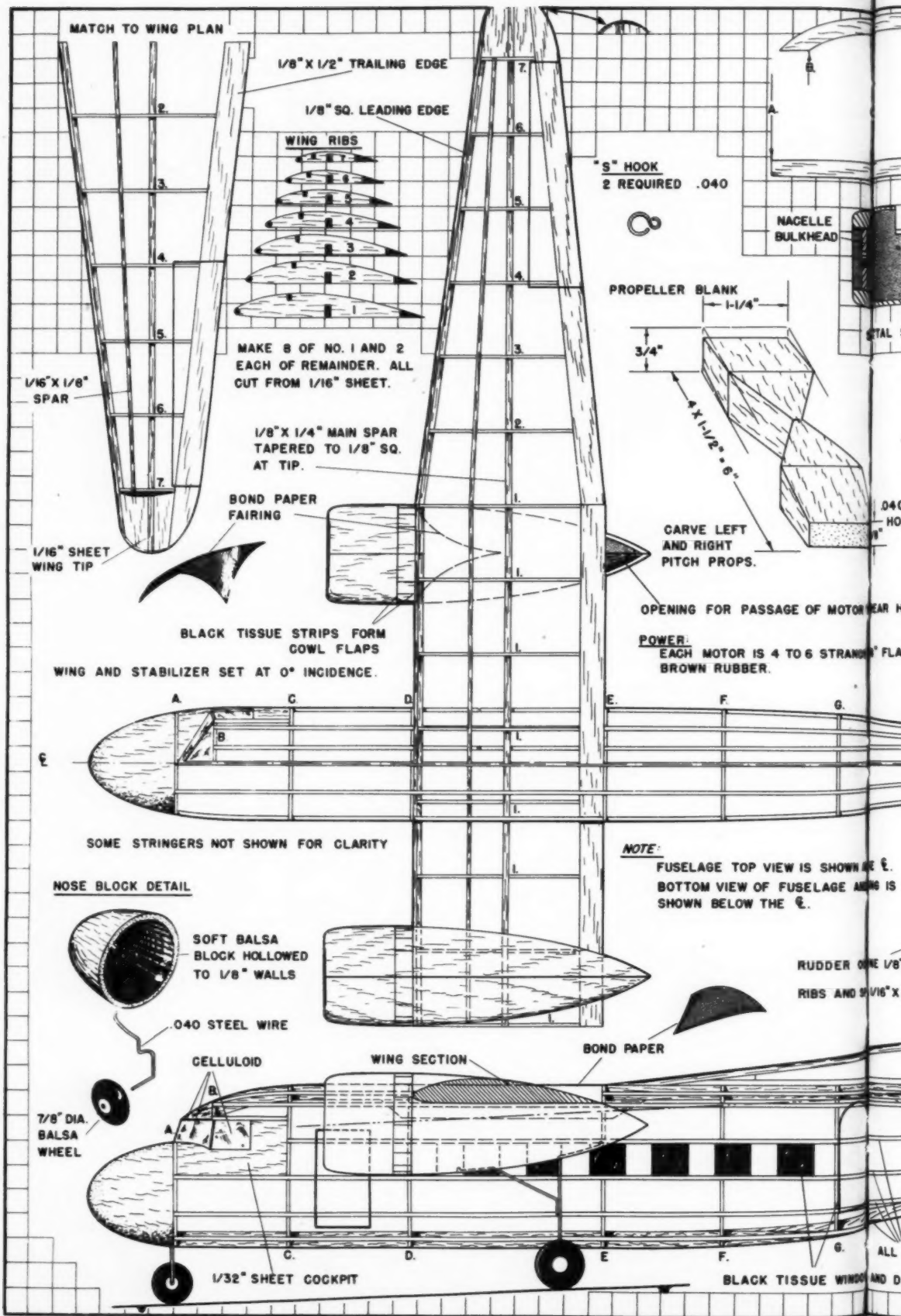
The model is a very pleasing performer. Takeoffs and landings are particularly nice with the tricycle landing gear. Obviously propeller torque, one of model aircraft's biggest bugaboos, is eliminated with the counter-rotating props. Although extra work is involved in winding up the motors, the flying results are more than worth the effort. The preliminary flights were held indoors where we found that 4 strands of 1/8 flat brown rubber in each motor was powerful enough to have our model "dead stick" at about 30 feet. We attribute this feat to the careful selection of material we put into the model. For example, all structures that had no stress on them (nose block, nacelles, wingtips, etc.) were cut from the lightest indoor grade balsa obtainable. Colored dope was shied away from except on props and wheels. In other words a definite effort was made to keep the weight of the model to a minimum.

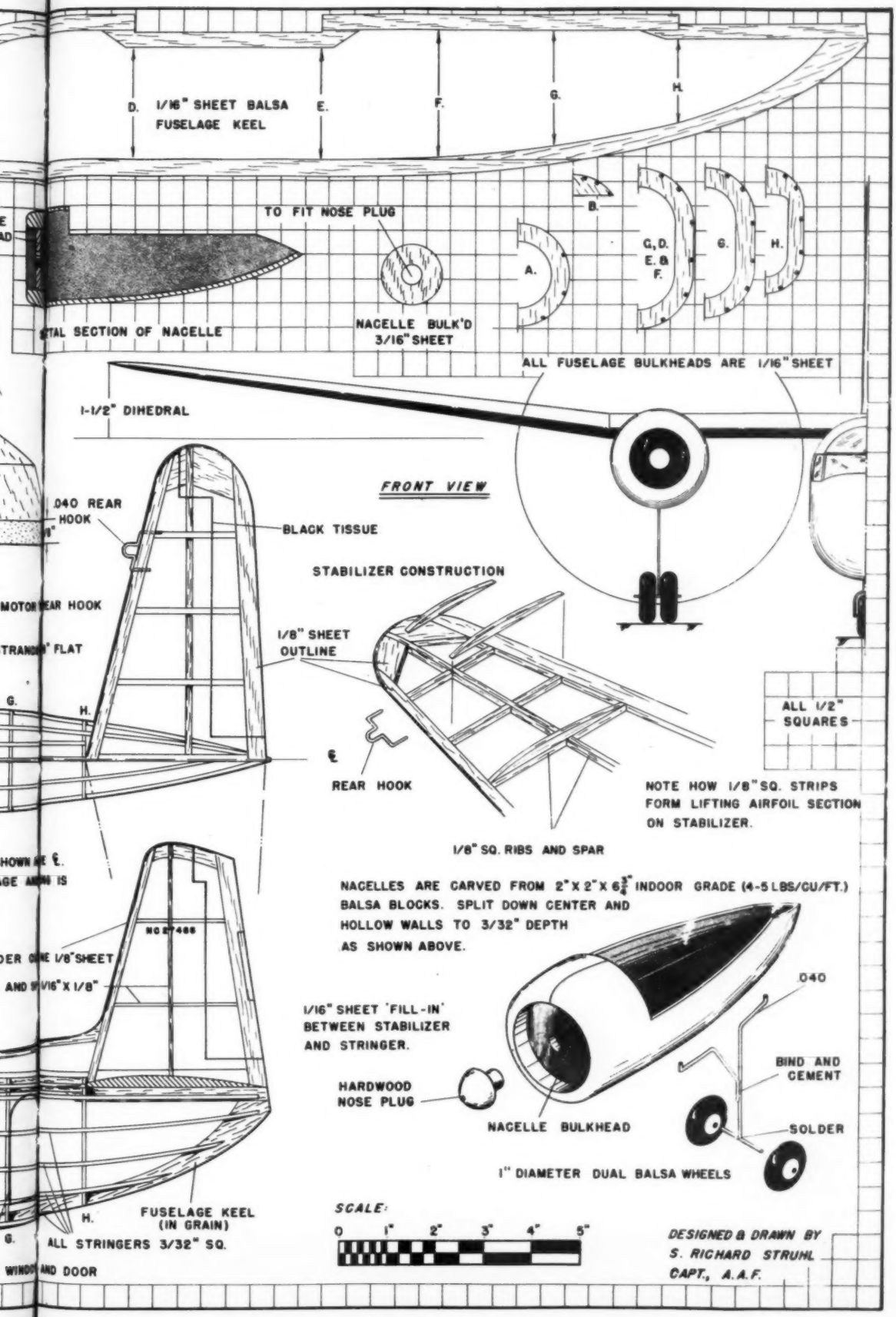
Although the model is a twin engined flying scale, don't let this fact frighten you. A short study of the plans will convince you that the construction is as simple as can be and even beginners should have no difficulty. The only catch for the "lazy hounds" is the fact that you can't purchase the propellers. They must be carved as shown because no model manufacturerers produce a left handed prop. But both props shouldn't take over an hour's work, so buckle down, sharpen your knives and dig in.

The plans are drawn to a convenient scale and may be enlarged by employing a set of dividers or the 1/2" graphs.

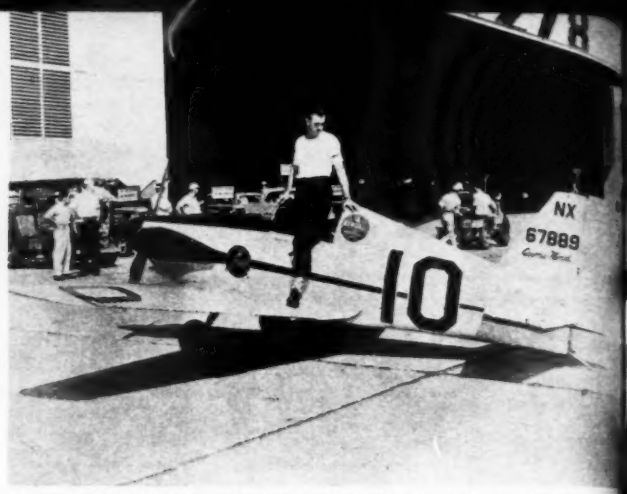
First cut the fuselage bulkheads, fuselage keel and wing ribs from 1/16" sheet balsa, and the two nacelle bulkheads from 3/16" sheet. Use light quarter grained balsa for these parts. Pin the fuselage keel over the plans and cement the bulkheads in their proper locations, checking the alignment

(*Turn to page* 77)

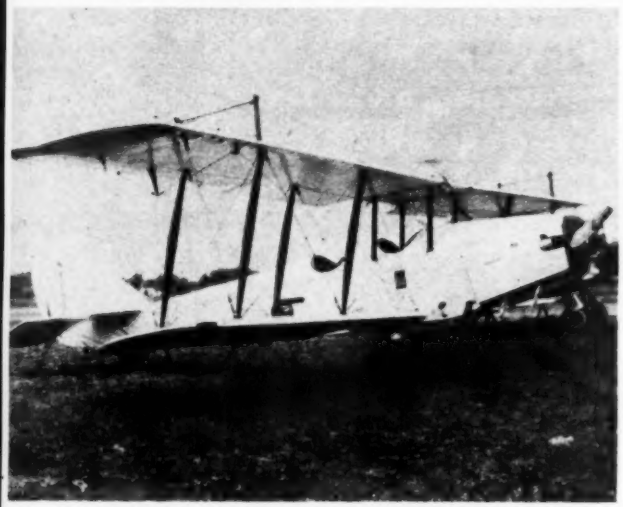

MATCH TO WING PLAN
1/8"X 1/2" TRAILING EDGE
1/8" SQ. LEADING EDGE
WING RIBS
MAKE 8 OF NO. 1 AND 2 EACH OF REMAINDER. ALL CUT FROM 1/16" SHEET.
1/16"X 1/8" SPAR
1/8"X 1/4" MAIN SPAR TAPERED TO 1/8" SQ. AT TIP.
BOND PAPER FAIRING
1/16" SHEET WING TIP
BLACK TISSUE STRIPS FORM COWL FLAPS
WING AND STABILIZER SET AT 0° INCIDENCE.
"S" HOOK 2 REQUIRED .040
NACELLE BULKHEAD
PROPELLER BLANK
1-1/4"
3/4"
4 X 1-1/2" • 6"
CARVE LEFT AND RIGHT PITCH PROPS.
OPENING FOR PASSAGE OF MOTOR REAR H
POWER:
EACH MOTOR IS 4 TO 6 STRANDS FLA
BROWN RUBBER.
SOME STRINGERS NOT SHOWN FOR CLARITY
NOTE:
FUSELAGE TOP VIEW IS SHOWN ABOVE ℄.
BOTTOM VIEW OF FUSELAGE AFT IS SHOWN BELOW THE ℄.
NOSE BLOCK DETAIL
SOFT BALSA BLOCK HOLLOWED TO 1/8" WALLS
.040 STEEL WIRE
CELLULOID
WING SECTION
BOND PAPER
7/8" DIA. BALSA WHEEL
1/32" SHEET COCKPIT
RUDDER
RIBS AND
BLACK TISSUE


D. 1/16" SHEET BALSA FUSELAGE KEEL
E.
F.
G.
H.
TO FIT NOSE PLUG
B.
A.
G, D. E. & F.
G.
H.
NACELLE BULK'D 3/16" SHEET
ALL FUSELAGE BULKHEADS ARE 1/16" SHEET
1-1/2" DIHEDRAL
FRONT VIEW
.040 REAR HOOK
BLACK TISSUE
STABILIZER CONSTRUCTION
1/8" SHEET OUTLINE
ALL 1/2" SQUARES
REAR HOOK
NOTE HOW 1/8" SQ. STRIPS FORM LIFTING AIRFOIL SECTION ON STABILIZER.
1/8" SQ. RIBS AND SPAR
NACELLES ARE CARVED FROM 2" X 2" X 6 3/4" INDOOR GRADE (4-5 LBS/CU/FT.) BALSA BLOCKS. SPLIT DOWN CENTER AND HOLLOW WALLS TO 3/32" DEPTH AS SHOWN ABOVE.
1/16" SHEET 'FILL-IN' BETWEEN STABILIZER AND STRINGER.
.040
BIND AND CEMENT
HARDWOOD NOSE PLUG
NACELLE BULKHEAD
SOLDER
1" DIAMETER DUAL BALSA WHEELS
H.
FUSELAGE KEEL (IN GRAIN)
ALL STRINGERS 3/32" SQ.
SCALE:
0 1" 2" 3" 4" 5"
DESIGNED & DRAWN BY S. RICHARD STRUHL CAPT., A.A.F.

Fourth place in Goodyear Race was taken by Tony Le Vier in *Cosmic Wind*



Another *Cosmic Wind* flown by H. Salmon won third in small plane event



Curtiss *Jenny* with *Rangor* in place of old OX5 flew in stunt events

Goodyear winner was Wm. Brennand in *Buster*, built by S. J. Wittman

CLEVELAND

by J. L. MACKENZIE

New designs of interest to modelers appeared at this year's races

ALTHOUGH the sale of surplus fighter craft by our government was undoubtedly the shot in the arm that air racing needed for its postwar revival, this same fact has brought about a situation which may necessitate a completely revised code of limitations on closed course racing.

As was so ably demonstrated at last year's races, this sale policy not only made it possible for our veteran racing pilots to overcome the high cost bugaboo which threatened to stifle the sport in prewar days, but it also stimulated returning G. I. fliers to enter the exciting game. So again this year we saw the cream of wartime fighter craft as adapted to racing by individual American ingenuity, in the fastest competition of aviation history.

Add to the aforementioned the breathtaking speed of the jet events, and the return of the small pylon polishers so characteristic of prewar National Air Races, and you have the background for what has been appropriately advertised as "the most exciting show on earth". With an all time high in the number of entries and more major events scheduled than ever before, the 1947 Races achieved a new peak in record breaking flying.

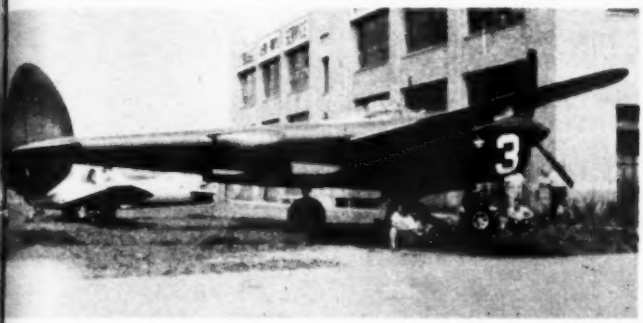
The grueling cross-country Bendix Derby from Van Nuys, Calif. to Cleveland saw a new record of 460.423 mph hung up by Paul Mantz in his bright red P-51. And his margin of victory over second place Joe DeBona was a slim 1 min. 17.6 sec. for the 2045 mile flight! The 44 year old movie stunt man thus became the first man to win the race two successive years. His winning speed last year was 435.501 mph. Mantz's success in transcontinental flying is due in no small part to his pre-race flight planning which afforded him tail winds all the way. His rebuilding of the *Mustang* to carry enough fuel to make the flight non-stop without using external tanks was the master touch that led to victory. In addition to the $10,000 prize, the colorful Hollywood flier collected a $10,000 side bet he made with Texas oilman Glenn H. McCarthy, whose pilot Jim Ruble was forced to bail out of his flaming P-38 25,000 feet over Arizona.

Unfortunately, the jet division of the Bendix was declared "no race" when the four participating *Shooting Stars* were dispersed to other landing areas by a severe squall which engulfed Cleveland Airport at the time of their scheduled arrival. However, Col. Leon W. Gray, commander of the 67th Reconnaissance Group at March Field, Calif. made the best time of 4:04:18 or 503.123 mph. Col. Gray won the same event in 1946 at 497.779 mph.

The Thompson Trophy Race, speed classic of international aviation, produced the roughest, toughest 45 minutes of air racing the world has ever seen. With four crashes and the tragic death of one pilot, the authorities are faced with the question of whether aircraft of unlimited horsepower and design can continue to compete around a short closed course.

Thompson Trophy was won by Cook Cleland in high-powered *Corsair*

Paul Mantz won Bendix Cross Country event in Rolls-Royce *Mustang*



Tony LeVier won Sohio Race and placed 5th in Thompson event with P-38

Banger Bill flown by owner W. F. Robinson was sixth in Goodyear race

Another Goodyear winner, *Loose Special* was flown to fifth place

Art Chester's attractive *Swee' Pea* was second in Goodyear Trophy event

AIR RACES

The Thompson attracted the largest entry list in its history. However, practical considerations make it necessary to limit the field to 12 starters, those having the highest qualifying speeds. The race was flown over a 15 mile rectangular course, consisting of 20 laps for a total of 300 miles. Two laps of the course served as a pre-race qualifying trial. Since the event is flown from a race horse start, the element of competition is at a peak.

The starting lineup on Labor Day included four special *Corsairs*, four *Mustangs*, two *Lightnings*, an *Aircobra* and a *Kingcobra*. Because the Air Race officials anticipated that the P-63 which had finished another race only ten minutes before would be unable to make the starting deadline, the thirteenth qualifier, a Curtiss P-40 Q was allowed to start.

The first hint of tragedy came within a few seconds after the dip of the starter's flag, when Jack Hardwick walked away from the wreckage of his P-51, whose motor quit just as he cleared the airport.

After working his way from fourth position at the takeoff to first place in three laps, Cook Cleland built up a comfortable lead which he never relinquished until his big blue *Corsair* poked its nose across the finish line. In winning the race Cleland averaged 396.1 mph, a new world record for closed course flying. His victory proved again the superiority of horsepower in this type of competition. His ship, an F-2G, is the most powerful single engine type ever built, carrying a 28 cylinder Pratt & Whitney 4360 Wasp Major rated at 3800 hp. Water injection is believed to have boosted the racing output to 4000 hp. An identical plane, also owned by Cleland, finished in second place with Richard Becker at the controls. But the Cleland stables were destined to share tragedy with victory. Their third *Corsair* carried young Tony Jannazo to his death when he apparently blacked out or otherwise lost control of his flying powerhouse in a pylon turn during the fifth lap.

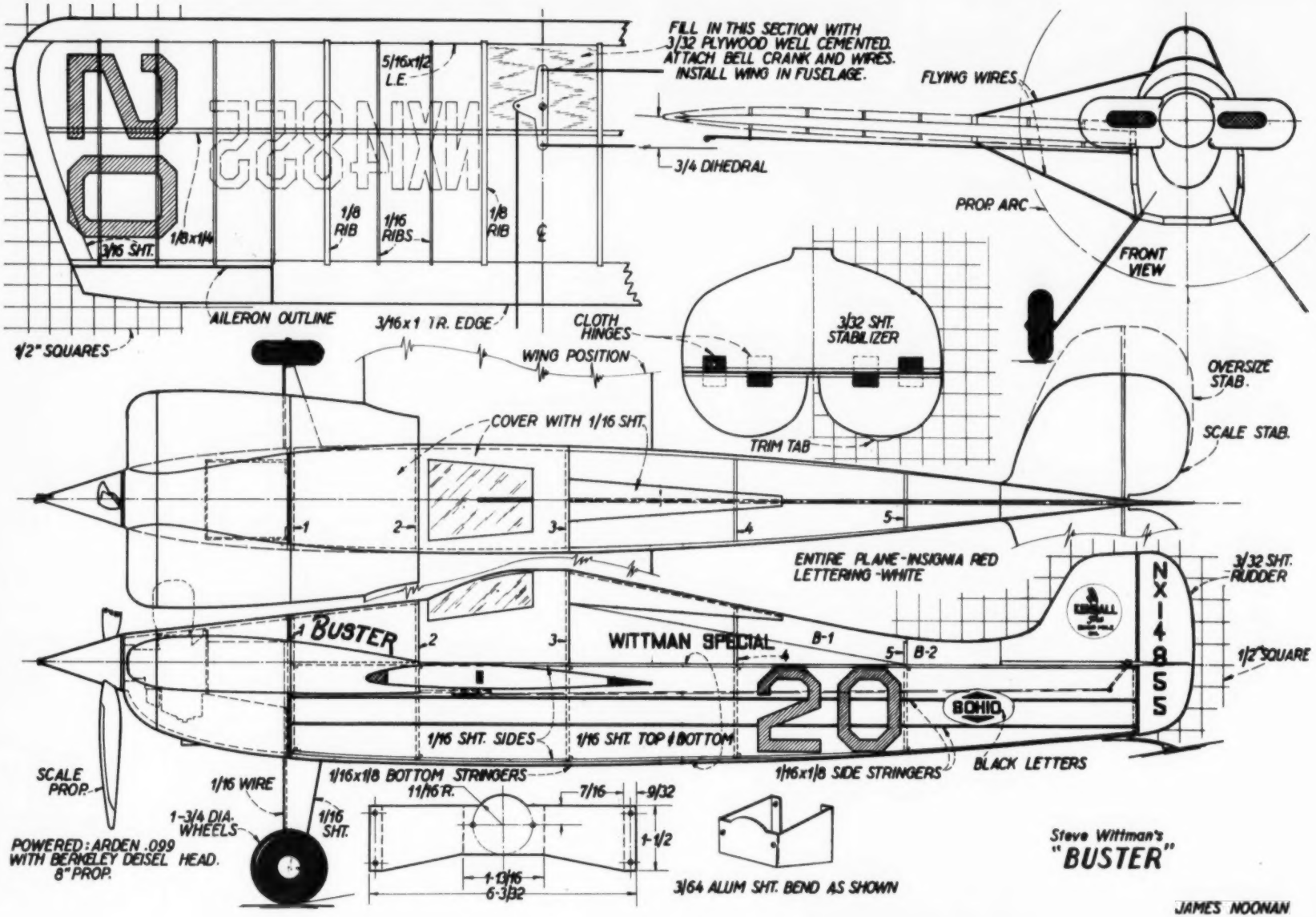
The tremendous speed of the F2-G was further emphasized by Ron Puckett who got his *Corsair* off to a late start one lap behind the field, yet worked his way up to fourth position before engine trouble forced him out in the 19th lap.

Jay Deming's skillful piloting of the P-39 which won the 1946 race netted him third place behind his more powerful competitors at a speed of 389.873 mph, far exceeding last year's record of 379.3. And let's not forget to take our hats off to that "fox of the airways", Tony LeVier, who flew a badly out-classed P-38 into fifth place.

Out of the 13 starters in the Thompson, only 6 finished! In addition to the two previously mentioned crashes, Jean Zeigler parachuted from his P-40 in full view of the grandstand, and Woodrow Edmundson was seriously injured in a crash landing of his P-51. Charles Walling in his P-38, Paul Penrose in a P-51, and Ron Puckett all landed safely at the airport. As a consequence of the disastrous outcome of this twelfth running of the Thompson classic, we may never again see this race run on an unlimited basis.

Most spectacular and fastest of all the closed course racing was the Thompson "J", a jet event limited to military par-

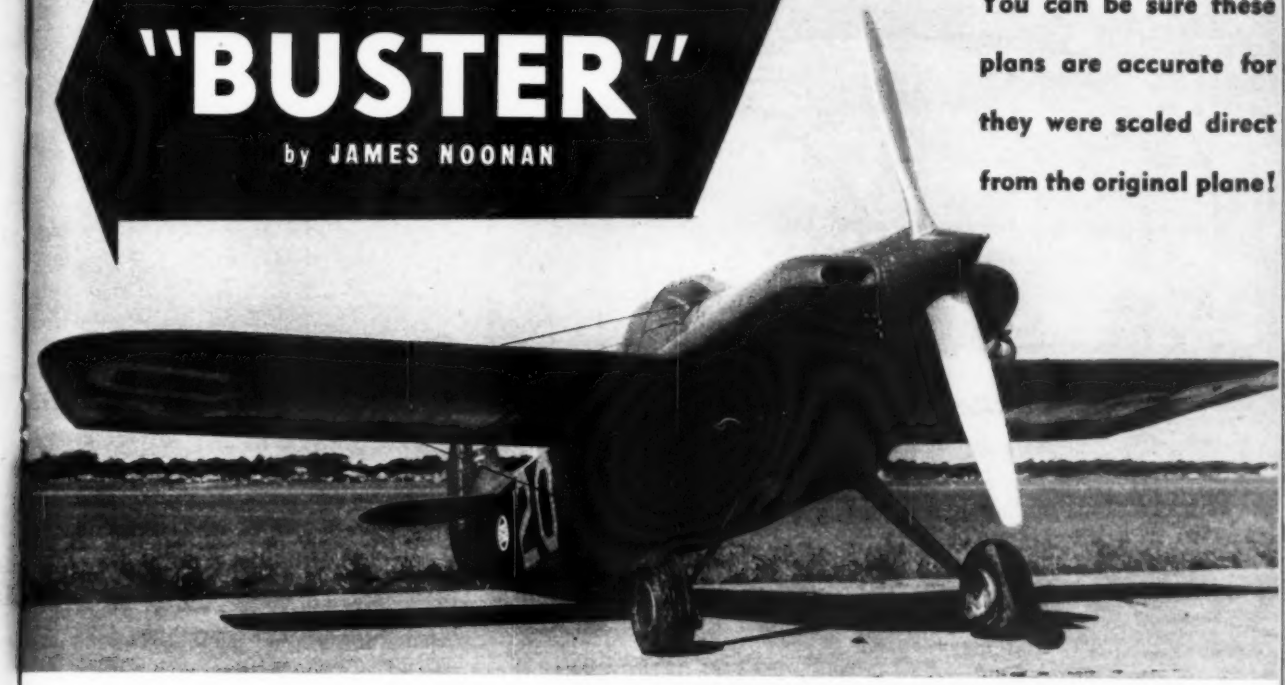
(Turn to page 66)


FILL IN THIS SECTION WITH 3/32 PLYWOOD WELL CEMENTED. ATTACH BELL CRANK AND WIRES. INSTALL WING IN FUSELAGE.
5/16x1/2 L.E.
FLYING WIRES
3/4 DIHEDRAL
PROP. ARC
FRONT VIEW
1/8 RIB
1/16 RIBS
1/8 RIB
3/16 SHT.
1/8x1/4
AILERON OUTLINE
3/16x1 T.E.
CLOTH HINGES
3/32 SHT. STABILIZER
1/2" SQUARES
WING POSITION
OVERSIZE STAB.
SCALE STAB.
COVER WITH 1/16 SHT.
TRIM TAB
ENTIRE PLANE-INSIGNIA RED LETTERING-WHITE
3/32 SHT. RUDDER
BUSTER
WITTMAN SPECIAL
B-1
B-2
NX14855
1/2 SQUARE
20
BOHIO
1/16 SHT. SIDES
1/16 SHT. TOP & BOTTOM
1/16x1/8 SIDE STRINGERS
BLACK LETTERS
SCALE PROP.
1/16 WIRE
1/16x1/8 BOTTOM STRINGERS
11/16 R.
7/16
9/32
1-1/2
1-3/4 DIA. WHEELS
1/16 SHT.
1-13/16
6-3/32
POWERED: ARDEN .099 WITH BERKELEY DIESEL HEAD. 8" PROP.
3/64 ALUM SHT. BEND AS SHOWN
Steve Wittman's "BUSTER"
JAMES NOONAN

"BUSTER"

by JAMES NOONAN

You can be sure these plans are accurate for they were scaled direct from the original plane!



Big *Buster*, shown above, proved unbeatable at the Cleveland Races

BUSTER is the latest version of a long line of racers and, like many of its competitors at Cleveland, was a rebuilt prewar job. About the only thing original on *Buster* is the fuselage and tail; everything else was newly designed and built to fit the Goodyear trophy rules. Looking more like a model than a real ship, *Buster* is really tiny (the pilot is a little fellow, too!) A careful examination shows that all the care and simplicity with utility incorporated into the design, plus excellent piloting, made it unbeatable.

We visited Steve Wittman's home airport at Oshkosh, Wis., and, thanks to him, made these drawings directly from the original.

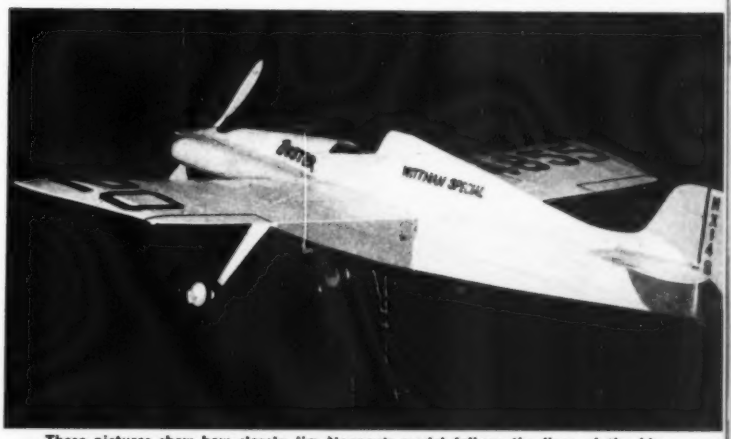
The plane is most useful as a control line model, therefore it is presented as such. The original has a span of 16'. Our model is built to a scale of 1-1/2" = 1', or 24" span. An *Arden .099* with diesel head is used and smooth flight is obtained with a very light model. However, it should take up to .45 cu. in. motors with ease.

FUSELAGE—Begin by laying out full size plans, enlarging the plan on page 14 three times. The fuselage sides (1/16" sheet) extend from Station 1 to the tail post. Cement 1/16" square at all stations, then join both sides holding them apart with 1/16" sq.; cover top and bottom with 1/16" sheet. Thus we have our basic fuselage. Cut slots in both sides to take the wing spars. Attach motor mount and landing gear to firewall and cement firewall in place. Add bulkheads at Stations 1 to 5, then stringers, and sheet cover the top where indicated. Add 1/16" x 1/8" stringers to sides and bottom.

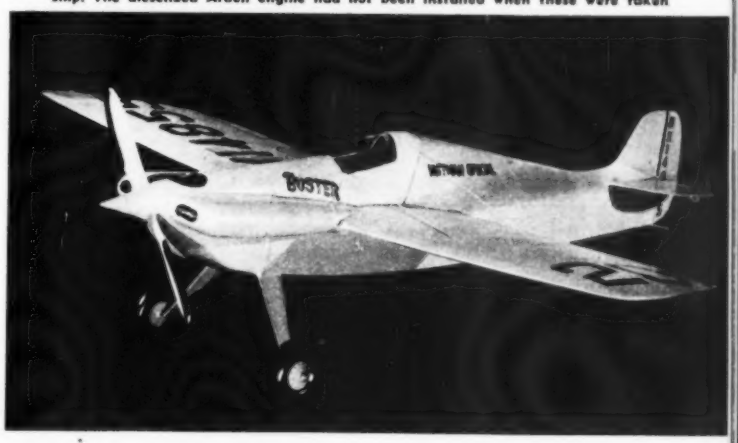
WING—Cut ribs and spars; assemble two wing panels, mount bellcrank as shown, attach control wires. Sand and cover wing. Cut away a section of the body, insert wing, cement body section back in place. Attach tail surfaces and hook up control to elevators. Cover body with heavy paper or silk.

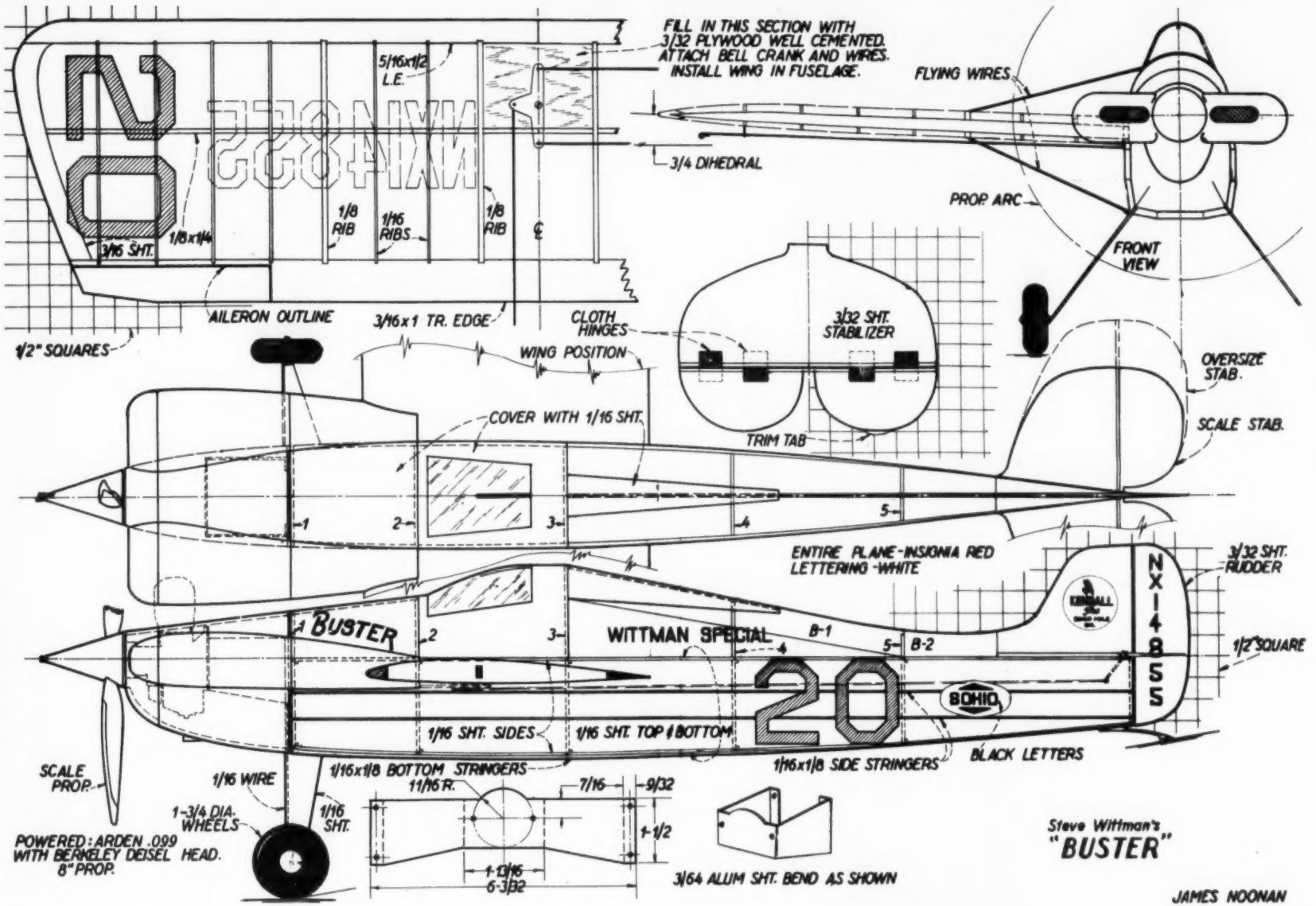
NOSE BLOCK—Jigsaw pieces roughly to shape and cement to nose of body. When dry, carve, sand and finish in this position. Cut off and hollow to desired thickness, cement back to nose, first installing motor.

Go over entire ship adding small details, then spray or brush on several coats of insignia Red (Fokker red), adding license numbers and other details later.



These pictures show how closely Jim Noonan's model follows the lines of the big ship. The dieselized *Arden* engine had not been installed when these were taken

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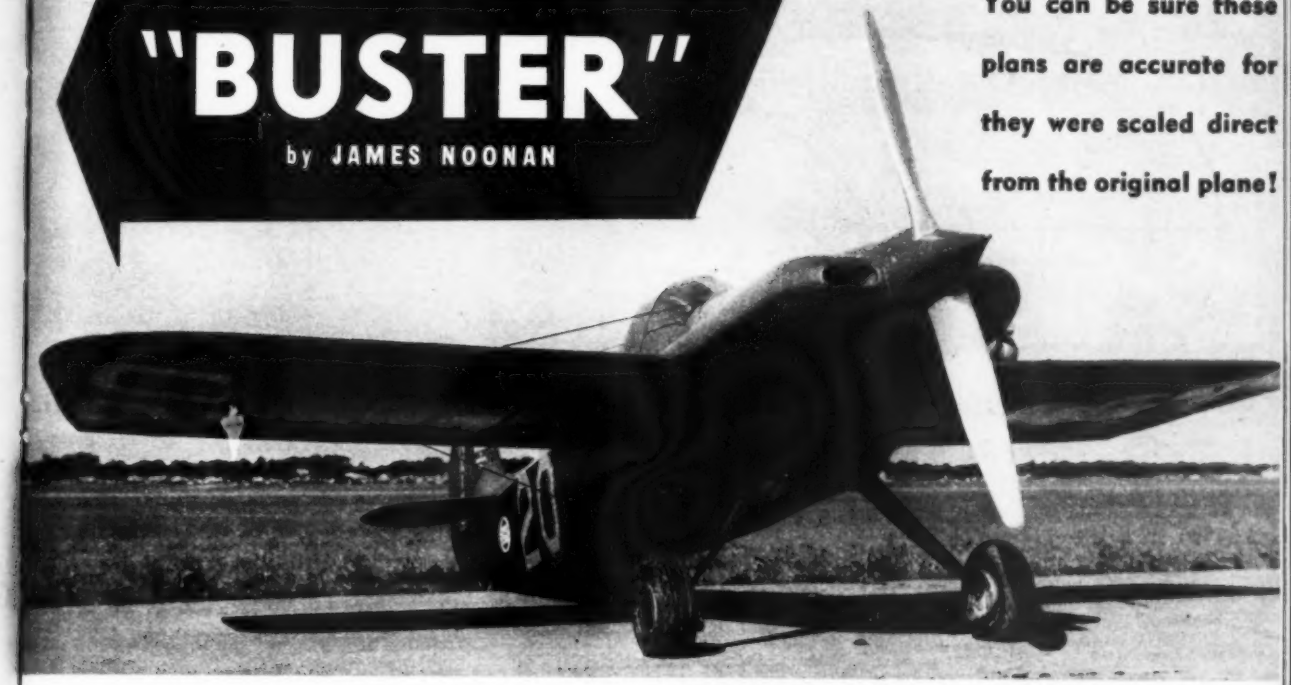

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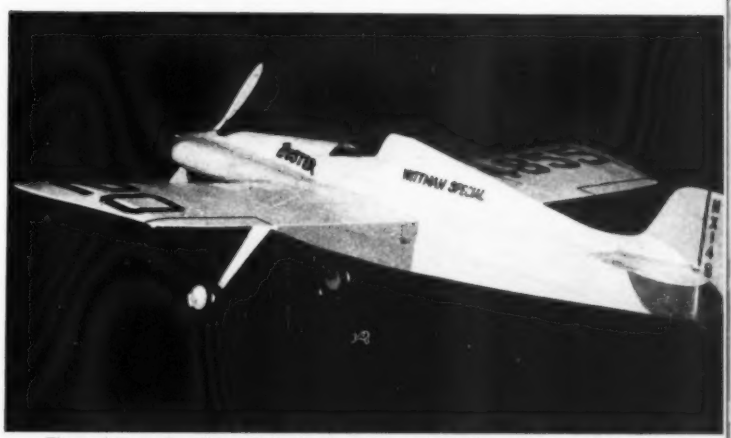

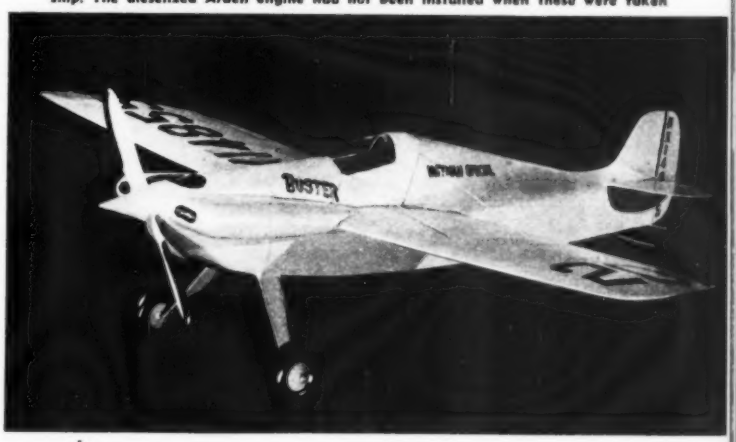

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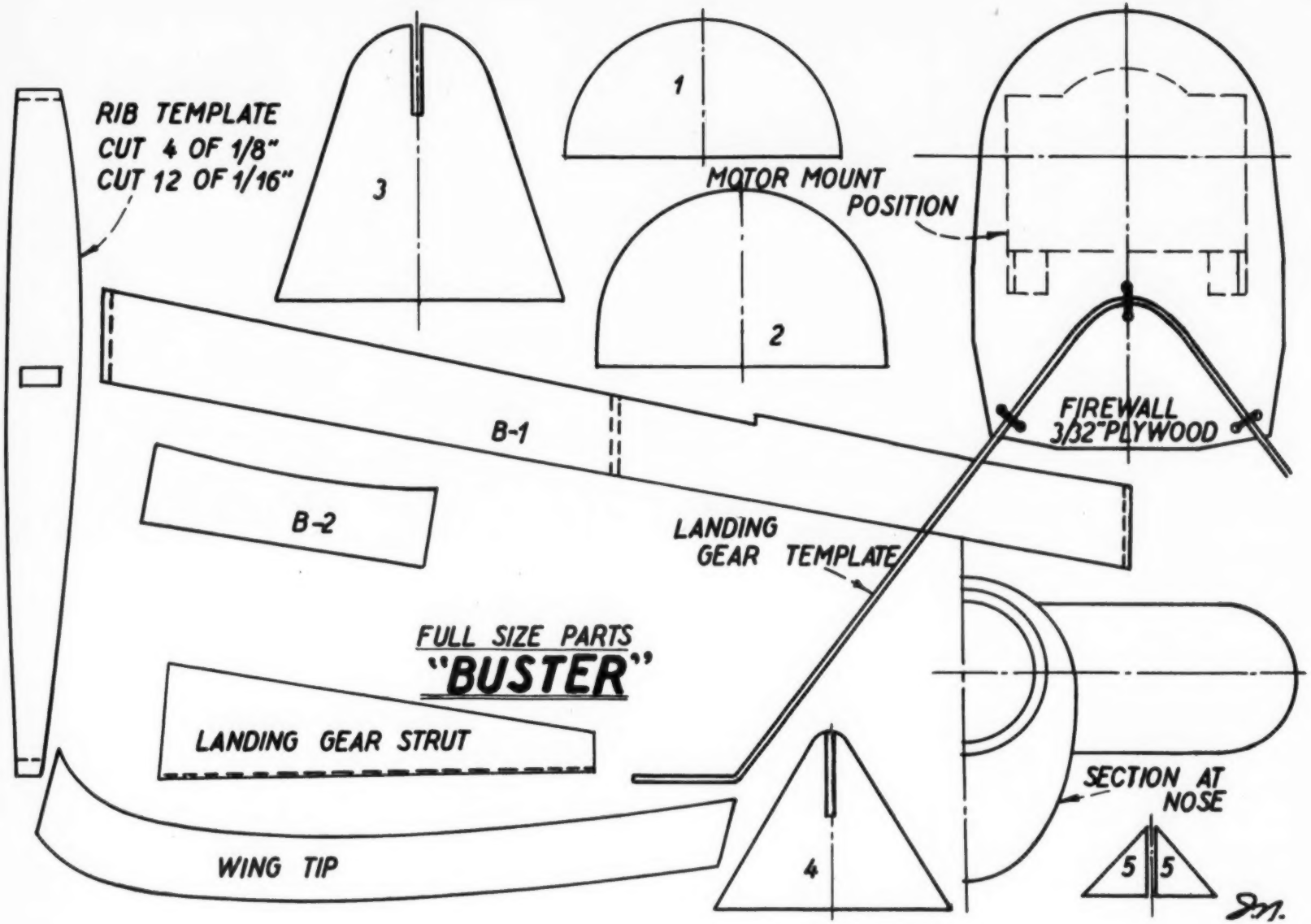

RIB TEMPLATE
CUT 4 OF 1/8"
CUT 12 OF 1/16"
3
1
MOTOR MOUNT
POSITION
2
FIREWALL
3/32" PLYWOOD
B-1
B-2
LANDING
GEAR TEMPLATE
FULL SIZE PARTS
"BUSTER"
LANDING GEAR STRUT
WING TIP
4
SECTION AT
NOSE
5 5

DESIGN FORUM

by CHARLES H. GRANT

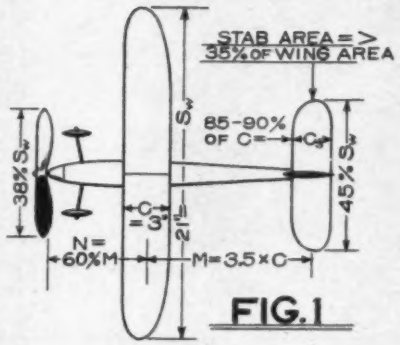


FIG. 1

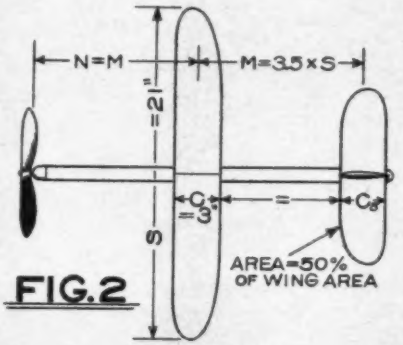


FIG. 2

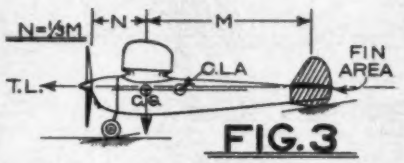


FIG. 3

FIG. 4

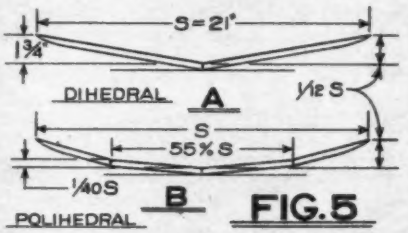


FIG. 5

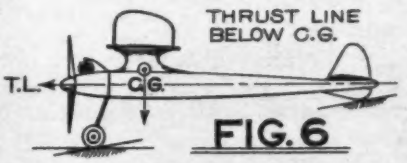


FIG. 6

FAR back in the early history of aviation when scientists were trying to piece together bits of information to help them solve the problem of flight, there were two basic but vastly different schools of thought. One was typified by James Pierpont Langley, while the Wright brothers were the most prominent exponents of the other.

Being a true scientist, Langley saw the problem in its most ideal and complete form and set to work to solve it in this manner. He believed that an airplane should not only have the capacity to rise from the ground, but that it should also be inherently stable and be able to continue in flight in a normal flight position, resisting disturbing forces and recovering its equilibrium when thrown out of balance. This it should do by itself without the prompting hand of a pilot. He believed that the pilot should merely guide the craft and that controls which he operated should be solely for this purpose—either to turn the craft right and left, up or down. It offended his ideal of an airplane to place in the hands of the pilot the added necessity of *balancing* the airplane. This he felt the airplane should do by itself; in other words, it should be inherently stable.

The Wright brothers, on the other hand, felt that getting into the air regardless of how it was done was the main objective. So they built a plane capable of rising from the ground and remaining in flight only so long as the pilot kept it on an even keel or brought it back to level flight when displaced by some disturbing force. In other words, they substituted control by the pilot for inherent stability. In fact, they solved only part of the problem of flight, leaving it to each individual pilot to attain skill sufficient to fly his airplane safely. To fly a plane in the early days was no small feat because a pilot had to *fly every second*. These early airplanes, especially the early Wright brothers', seemed to delight in flying out of rather than in balance, and it was necessary that the pilot make continual corrections with the controls.

Present day airplanes are great-grandchildren of the Wright conception and development. During the years, they have gradually been made more stable but lack the complete stability necessary to fly without a pilot.

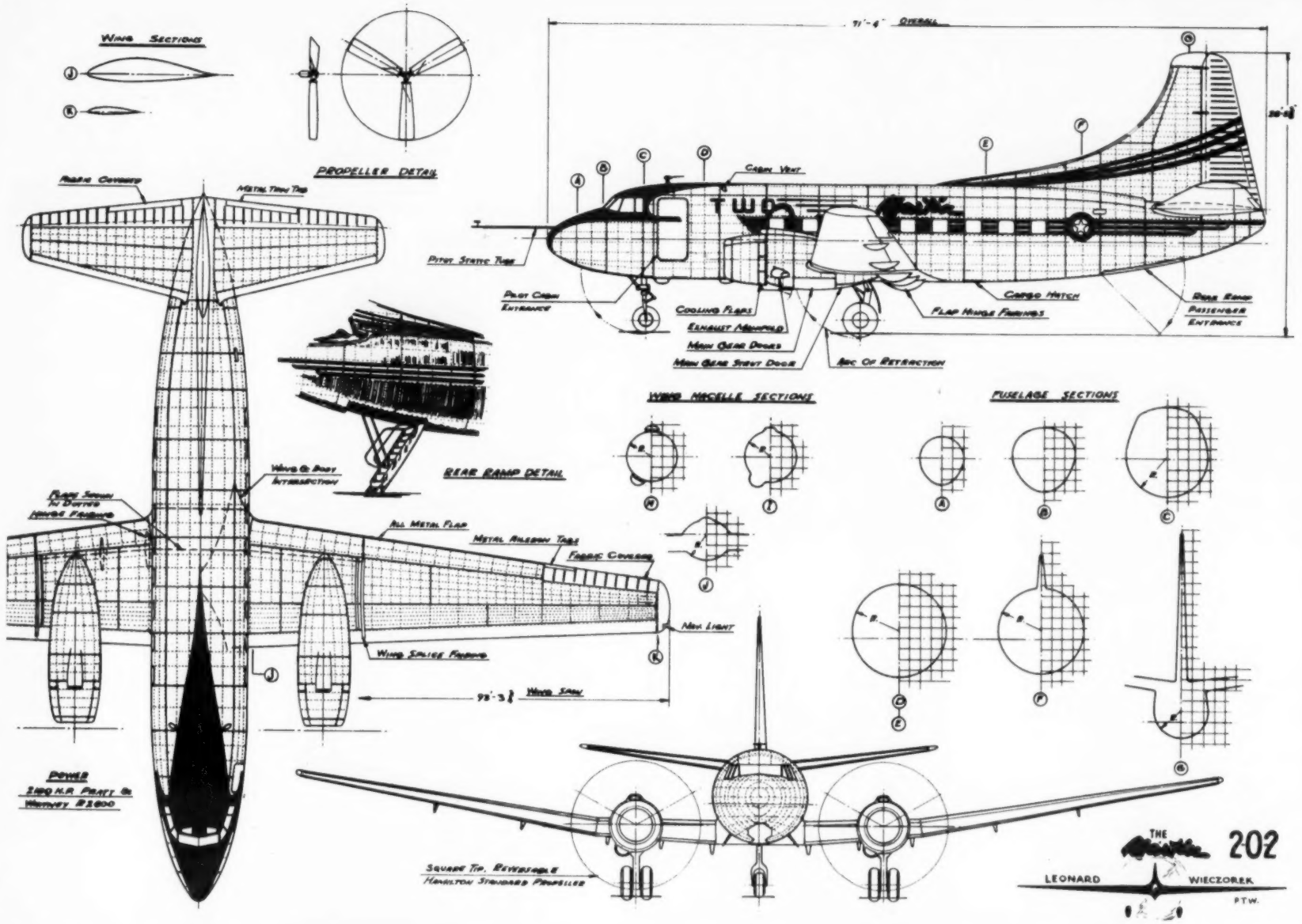
A parallel case exists in model flying today between free flight and U-control flight. Free flight is typical of Langley, and U-control of Wright. Actually, the same problems exist in this conflict of models as existed between the two schools of thought in the early days. Free flight requires a model to be inherently stable and possess qualities that will cause it to resist disturbing forces or recover its balance if displaced. With U-control planes, there are no such worries. A model can be completely unstable provided the pilot controlling it from the ground is sufficiently agile and dexterous. The U-control pilot substitutes control for stability. He is actually thrilled by the dexterity required to guide his craft, especially if it is unstable.

Thought, study and understanding of science is required to solve the stability problem in a free flight model. Free flight presents a scientific problem as a challenge to all who would build successful free flight planes. It is a problem which can be solved only by knowledge of *how to build a stable airplane*. It is a problem of the mind. Keeping your U-control plane in flight is not a matter of *mind* but of *hand* control. Such models are kept right side up merely by a movement of the wrist. The nature of these two types of planes is such that free flight appeals to the scientifically inclined model builder, while U-control appeals more to the sportsman type who prefers the thrill of action rather than the satisfaction of studying out a difficult, scientific problem.

It is true that considerable science is involved in U-control—the science of speed and of engine operation. However, these are usually problems of the designer of U-control models and not necessarily of the operator. Builders and fliers of free flight planes still have the problem of correct alignment and adjustment of surfaces in order to have the plane fly with stability. Though to some degree this problem is also present in U-control planes, it is not as important as in free flight.

There have been many arguments concerning the advantages and preference of free flight and U-control. Apparently, for the

(*Turn to page* 69)

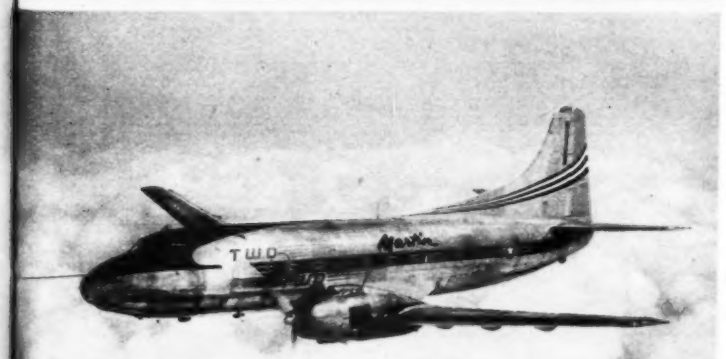


THE 202

LEONARD WIECZOREK

PTW.

PLANE ON THE COVER STORY



MARTIN 2-0-2

by ROBERT McLARREN

THE king is dead, long live the king! That, in an ancient cheer, is the cry of the nation's airlines as the valiant Douglas DC-3, one of the really great airplanes in history, makes way for the Martin 2-0-2 after 15 years of service in every nation, every climate and every type of flying activity. For the 2-0-2, our Plane on the Cover this month, has entered the service of the nation's airlines and assumed the proud mantle of "workhorse of the air".

Creation of the Martin 2-0-2 was a study in modern aeronautical science in every sense of the term, and furnishes a graphic indication of the long road aviation has traveled since its inception. From 1903 to World War II transport airplanes were designed and built with maximum performance as their primary objective, and airlines "shopped around" until they found the plane they wanted. Martin reversed this procedure and started the design of its projected transport by "shopping around" the airlines, determining *their* desires and tailoring the airplane to fit the need. (It will interest our readers to know that the principal "shopper" for Glenn L. Martin Co. was our old friend Maxwell B. Bassett, pioneer of the gas engine powered model airplane, first gas model Nationals' winner, and oldtime contributor to MODEL AIRPLANE NEWS—*Editor.*)

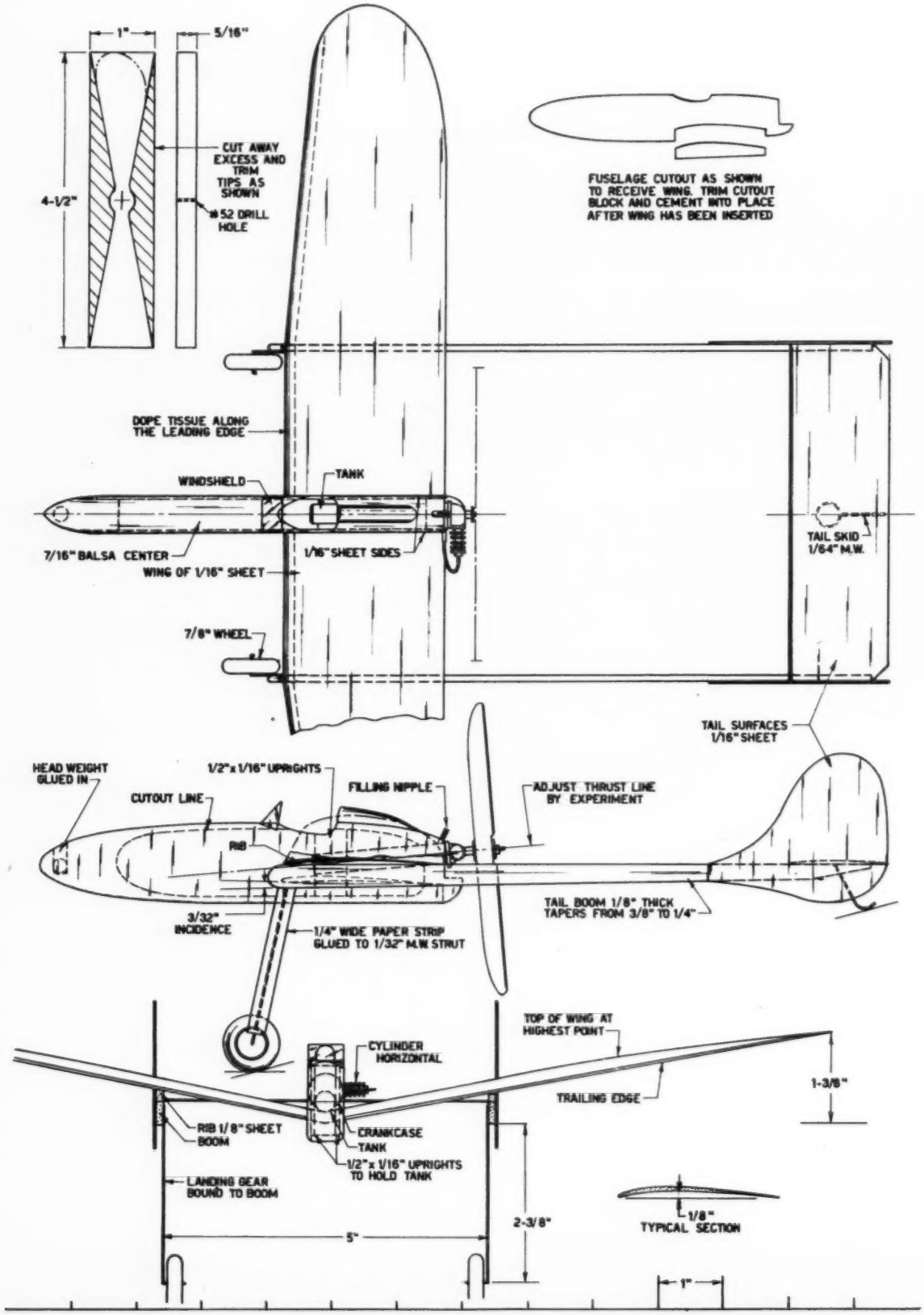
First question to be answered was: "What is the length of the average air trip?" Martin's studies revealed that 69% of all airline trips was 500 miles or less; 12% were from 500 to 800 miles; and 19% more than 800 miles. This determined the normal operating range of the new ship: up to 500 miles.

Second question was: "How many engines?" Studies of two, three and four engines showed that two (for safety) provided less weight per installed horsepower, less airplane drag, shorter ground time, less equipment and controls, and higher cruising speed under the same condition than three or four engines. (So far we have a twin engine airplane with a 500 mile range.)

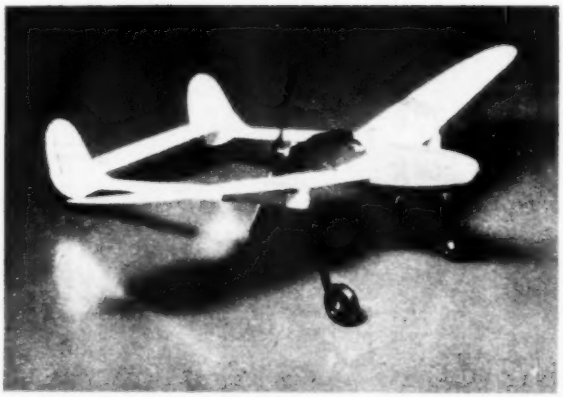
Next question was: "What wing loading and power loading shall be used?" This would determine the engine horsepower, wing area, and gross weight of the airplane. This question involved analysis of a series of designs divided into a low wing loading group with comparatively slow speed, good load-carrying ability, slow landing and short takeoff; and a high wing loading group with high speed, long takeoff and landing distance but shorter time in the air between points. Throughout these studies the designs had to meet the Civil Aeronautics Board's requirements, including a stalling speed of not more than 80 mph, a takeoff distance of 4000 ft. or less, and the ability to reach 10,000 ft. on one engine. The final solution indicated that wing loadings of between 40 and 50 lbs. per sq. ft. offered the fastest cruising speed combined with economy of operation. The selected figure of 44.5 lbs. per sq. ft. divided into the desired 38,000 lb. gross weight of the airplane produced 860 sq. ft. as the required wing area. (We now have a twin engine airplane with 500 mile range, wing loading of 44.5 lbs./sq. ft., wing area of 860 sq. ft., and a power loading of about 9 lbs. per hp.)

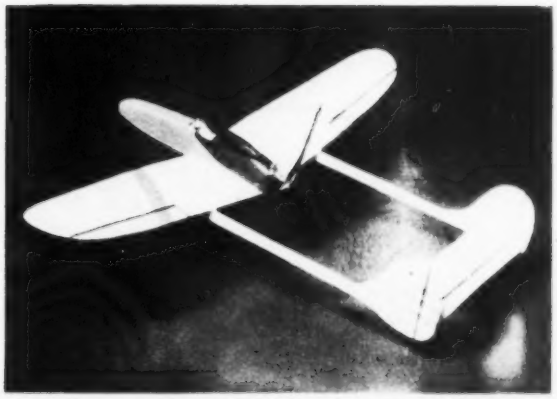
Next question was: "High or low wing?" The high wing offers advantages of convenience (getting into and out of the airplane), and vision for the passengers. However it would require long, complex landing gear struts and operating mechanism, con-

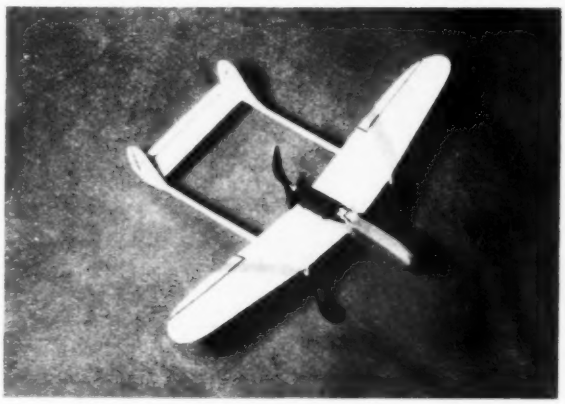
(*Turn to page* 60)

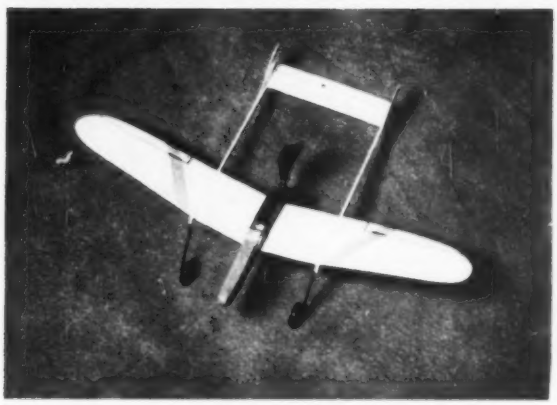

1"
5/16"
4-1/2"
CUT AWAY EXCESS AND TRIM TIPS AS SHOWN
#52 DRILL HOLE
FUSELAGE CUTOUT AS SHOWN TO RECEIVE WING. TRIM CUTOUT BLOCK AND CEMENT INTO PLACE AFTER WING HAS BEEN INSERTED
DOPE TISSUE ALONG THE LEADING EDGE
WINDSHIELD
TANK
7/16" BALSA CENTER
WING OF 1/16" SHEET
1/16" SHEET SIDES
TAIL SKID 1/64" M.W.
7/8" WHEEL
TAIL SURFACES 1/16" SHEET
HEAD WEIGHT GLUED IN
1/2"x 1/16" UPRIGHTS
CUTOUT LINE
FILLING NIPPLE
ADJUST THRUST LINE BY EXPERIMENT
RIB
TAIL BOOM 1/8" THICK TAPERS FROM 3/8" TO 1/4"
3/32" INCIDENCE
1/4" WIDE PAPER STRIP GLUED TO 1/32" M.W. STRUT
TOP OF WING AT HIGHEST POINT
CYLINDER HORIZONTAL
TRAILING EDGE
1-3/8"
RIB 1/8" SHEET
BOOM
CRANKCASE
TANK
1/2"x 1/16" UPRIGHTS TO HOLD TANK
LANDING GEAR BOUND TO BOOM
2-3/8"
1/8"
TYPICAL SECTION
5"
1"

SUB-MIDGET CO_2









Build this tiny ship and enjoy power modelling in its smallest form

by HOWARD G. McENTEE

A GREAT many model builders have shown active interest in CO-2 powerplants since the first commercial unit of this type was introduced last spring. This form of power has been of especial interest to sport fliers, for it offers a clean foolproof way to indulge in motor-model flying, while the power produced is ample for good duration and even spectacular flights. The sport fliers like particularly the fact that with this style of motor they can spend more time on actual flying than with any other type of powered model; there is no fussing as with a recalcitrant internal combustion powerplant, and you don't even have to stop to wind it as with rubber.

Models flown with the *OK CO-2* engine have ranged from about 4 oz. up, and wingspans run around 3 ft.—definitely not backyard models, especially in view of the rather high times these models have produced. Many experimenters have felt that a lighter powerplant working on CO-2 would be ideal for strictly limited area flying, or even for indoor work.

Apparently others have had the same idea, and more important, have actually done something about it. The result is the *Campus A-100* power unit, an engine of 1/8" bore and stroke combined with a tiny tank 5/16" dia. by 2" long, weight of the entire works with a 4" propeller being about 1/4 oz. After much testing we feel this little unit will open up an entirely new field in the design of actual power models with spans of 12"-18" and top weight about 1 oz.

A model was built to try the new motor in, and since we were in a hurry to get results, all balsa construction was used. Because the motor looked so tiny and fragile it was decided to use it as a pusher, so that collisions with any solid objects around the flying field (trees, buildings or ground) would leave the motor undamaged. The manufacturers assure us that the powerplant is practically crackup proof, and indeed for its size it appears to be, but even so we want ours to live a long useful life.

Since we were not at all interested in contest results, an effort was made to achieve a "big plane look" and the accompanying illustrations show how it turned out. Frankly we were astounded at the results achieved; you won't believe it until you see it in action!

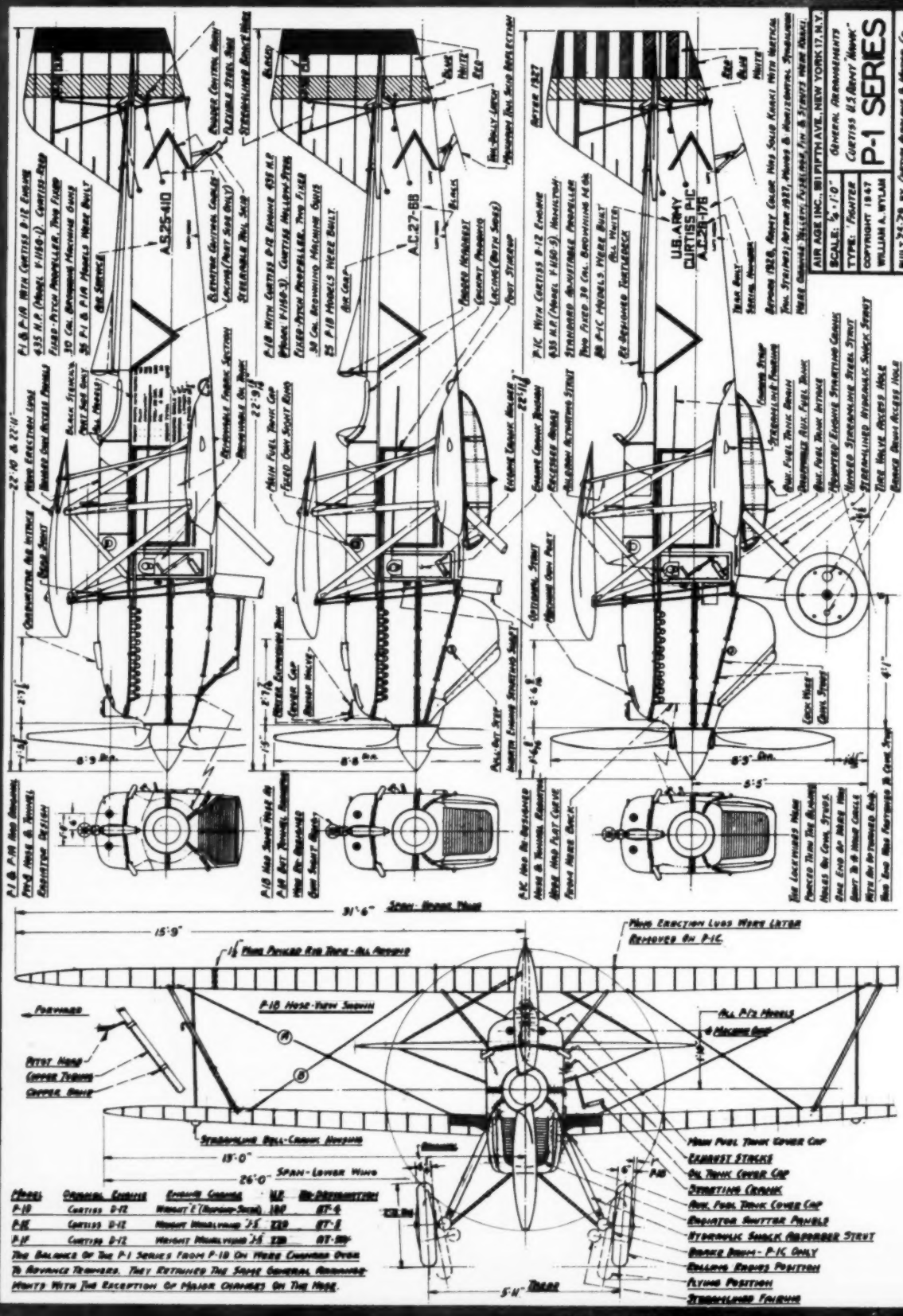
Before going further into this, however, let's go quickly through construction procedure. Note that grades of balsa are specified for most parts. In general, lightweight and soft balsa is used for almost all parts to keep weight down.

FUSELAGE—This is made of three pieces: a centersection of 7/16" thick soft balsa, and sides of 1/16" stock. With a jigsaw cut the main block to the outline shown, then cut the center out as indicated by dotted lines on the side view. Leave plenty of material at the nose for strength; weight is also needed at this

(*Turn to page* 58)

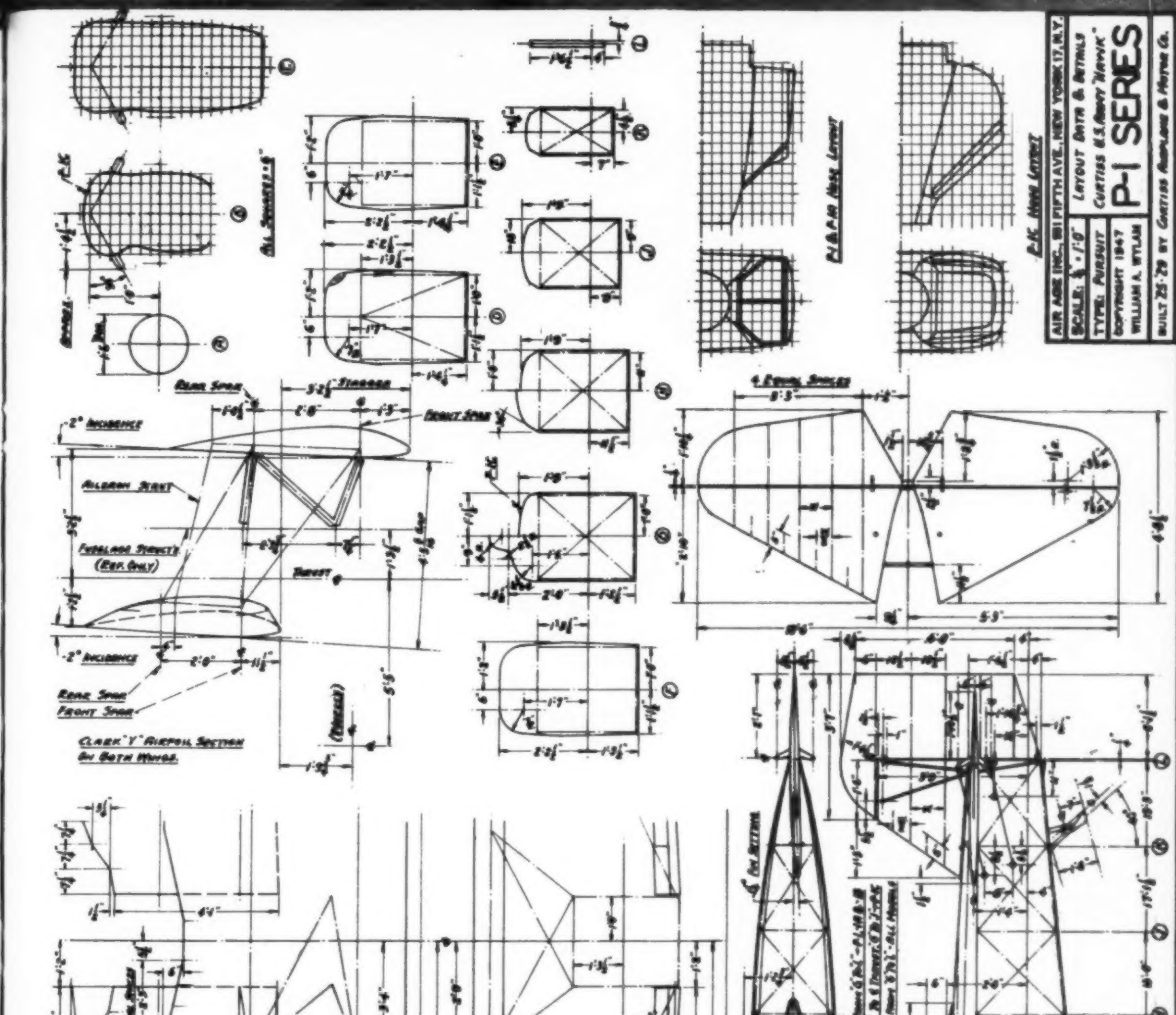
WYLAM MASTERPLAN ● WYLAM MASTERPLAN

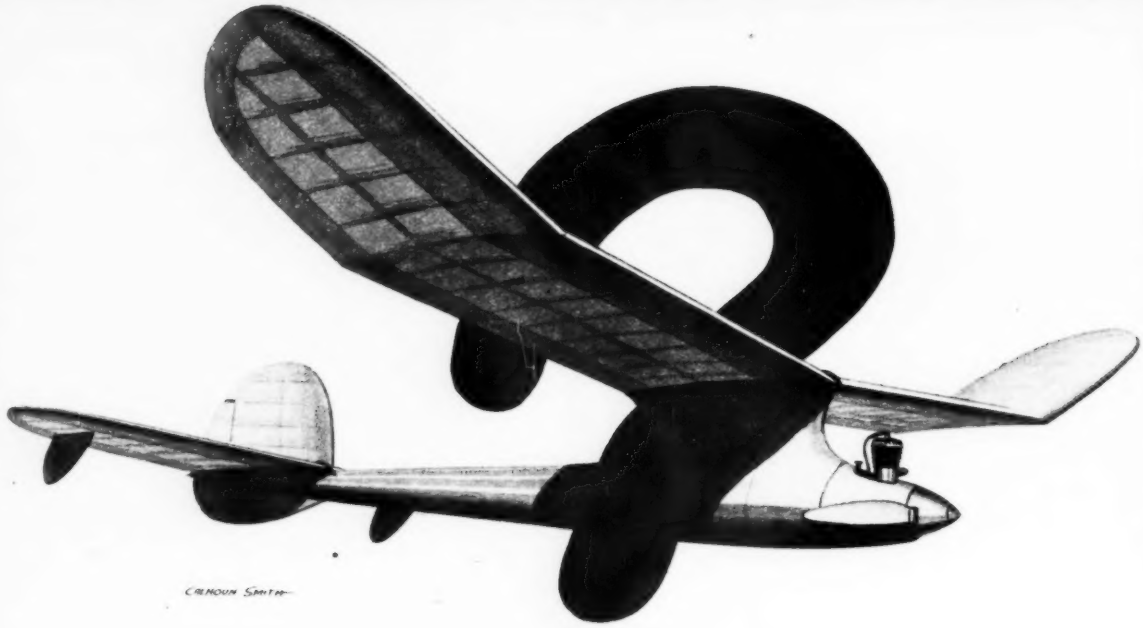
This is Part 2 of the Curtiss P1 Series



WYLAM MASTERPLAN ● WYLAM MASTERPLAN

To be concluded in the next issue.





WHAT WILL THE NEW RULES BE?

by BILL WINTER

The arguments over free flight seem to be growing in intensity. Current discussions are not so much between exponents of free flight vs. control line—even the diehards now generally admit both are here to stay—but between various schools of thought among the free flight enthusiasts, most of whom agree that "something will have to be done" to prevent free flight contest flying from becoming a lost art. It appears that the rules are due for considerable revision this year, and the new rules will probably be announced early in December. Meanwhile, an old free flight specialist here gives his ideas on what changes can or will be made. If you want to get an immediate start on the design of that super model for the 1948 contest season, learn under what rules your model will probably have to fly, according to Bill Winter.

WHAT looked like a major revolution in the free flight rules got off to a flying start at the AMA leaders meeting in Monticello during the National Contest. After those knock-down and drag-out fights that we used to have, it was almost beyond belief to hear any roomful of people agree to toss out wing loading requirements, increase power loading to 120 ounces, to forget landing gear and crossection rules, and to impose a ten-minute maximum flight time. While these proposed changes posed all sorts of thrilling possibilities in design, AMAers at large are proving less progressive than the crowd that attended the most famous of all contests.

At the time of writing there is serious doubt that the ten-minute flight rule will go through. As to removing the wing loading requirement, or eliminating landing gears and crossection rules, opinion is divided fifty-fifty. Only on the prospect of increasing power loading to 110 or 120 oz. per cu. in. displacement is there any probability of agreement.

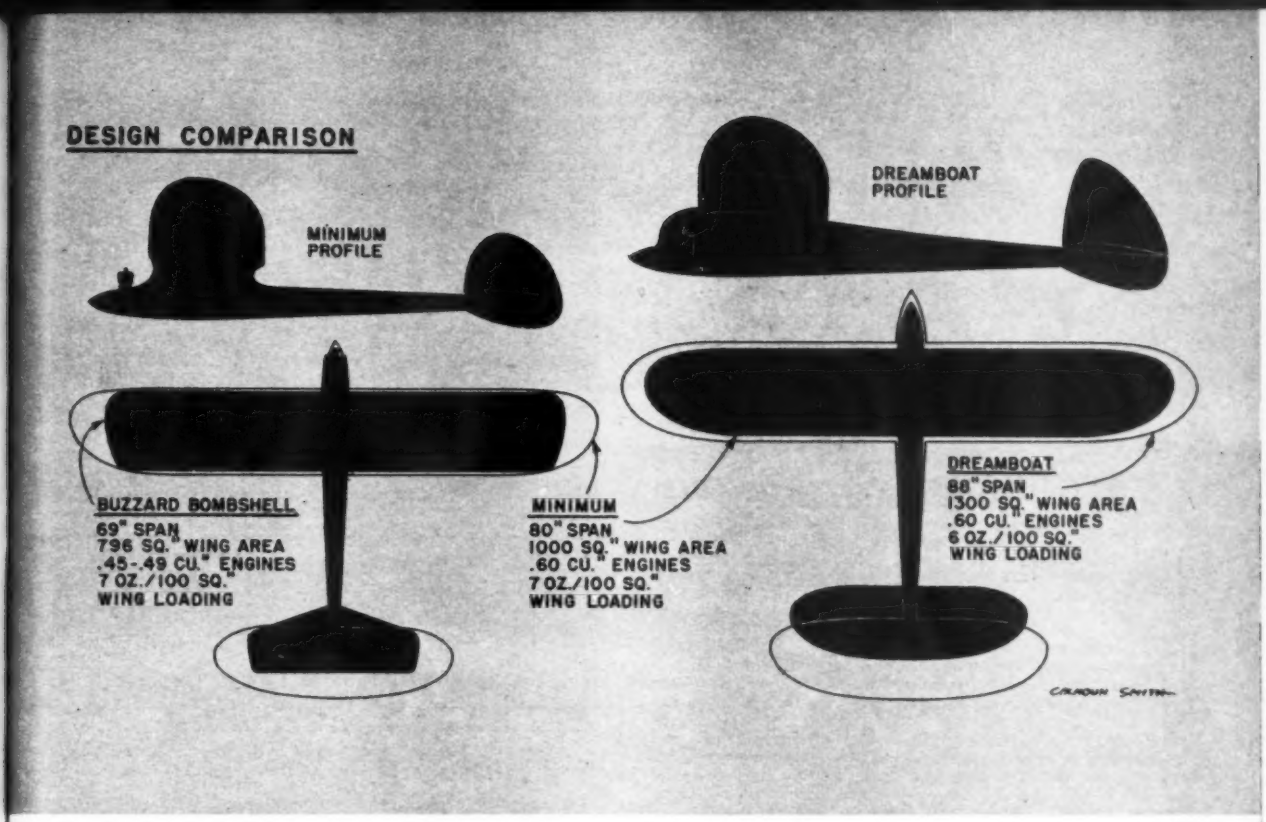
To understand what is going on, it is only necessary to realize that free flight is sick. Too many of the boys have succumbed to the lure of control line, which substitutes fancy footwork for marathons and, of course, eliminates the ship flying away almost the same day you built it. Postwar engines give almost any free flight design the oomph to get up and go —often forever. Performance under the present rules has become too good. And what is worse, the frightfully bad processing found at the bigger contests—especially some of those newspaper deals—have so discouraged the boys that for such reasons alone they would eliminate crossection and wing loading rules. It is possible, believe it or not, to wait all day to fly.

The thoughtful free flighter is mainly concerned about two things: 1, toning down performance to reduce out-of-sight flights; 2, eliminating rules that lead to delay in processing. (This latter may be the case of the builder, in the minority, who attends those super meets.) In the first category fall proposed increases in power loading, and flight time limits. In the second group are proposals for elimination of wing loading, and crossection. Because these two conditions do not harmonize, it is likely that any drastic cure-all rules would be hamstrung from the start.

For example, if wing loading is to be eliminated simply because the organization of some contests is so poor that models can't be processed quickly, or because entries are foolishly accepted without limit, then how, as one possible means of cutting performance, can you increase wing loading? Perhaps, then, before running down this line of thought it would help to consider the effects of the various changes that have been under consideration, for it is more than likely that this problem will be with us for years to come.

Taking the 120-oz. power loading, no wing loading, no crossection, and no landing gear proposals as a group, experts are agreed that the resulting model would be a lightly built floater. Most of them seem to think that the increased power loading would go towards balancing the wing loading rule. Moreover, the ten-minute flight rule proposal would be expected to bring out a rash of dethermalizers. The changed viewpoint of not having to risk the loss of the model in order to place, would reduce the number of out-of-sight flights of dethermalizer-equipped ships, despite the limitless wing area. But analysis indicates some interesting possibilities.

As we see it, if increased power loading and no wing loading rules were in effect, a designer would have three main choices. He could put smaller engines in present ships; he could design new ships to the new power loading but the old wing loading rule, which would give a sizable increase in wing area (more of this anon); or he could go off the deep end and toss in any amount of wing area he believed his new hot engine could elevate suffi-



ciently high to display its soaring prowess. In the latter case infinite variations are possible, and oldtimers who will recall Vernon Boehle's 15-footer with the *Baby Cyclone* at the prewar Nationals will know what we mean. Now if Boehle had only had something like an *Orwick*, or a *Super Cyke . . .!*

Checking further into present designs with smaller engines, we find that an old standby like the *Buzzard Bombshell* would work out with say a *Madewell 49*. You may have to toy around with the weight either way, but a *45* or a *49* seems about right. To visualize its performance you might think of the original *Brown*-powered *Bombshell* which won the 1940 Nationals Open with a flight of over 40 minutes. How would the *Madewell 49* compare with the old *Brown Junior* in handling a ship like the *Bombshell*?

Or take the *Comet Sailplane*. Here is a ship, always tops, that really came into its own in recent years with the appearance of powerful engines. Carl Goldberg had built and tried something like eleven sets of wings with as many airfoils—if we remember correctly—so that the ship is noted for its glide. With powerful engines such as we have today to make this ship kick up its heels in the climb, the *Sailplane* dominates Class C. To put a smaller engine in this airplane would directly lessen its performance. It becomes evident that, although many builders at first will try small engines in big ships, smart builders who design to take advantage of no crossection, and no wing loading, will soon compel a trend toward more original designs.

If wing loading should be relaxed the first question would be: how much wing area can I use? If you consider that the 7 oz. per 100 sq. in. wing area resulted in as light a structure as one would care to use, and a soaring ability that produced consistent out-of-sight flights, it seems unnecessary to think of lighter loadings. Suppose, for example, we consider a theoretical design for an *Ohlsson 60*. For the past six or seven seasons this airplane would have had to weigh, at 80 oz. per cu. in. displacement, a minimum of 48 oz. At 7 oz. per 100 sq. in. of wing it would have had a minimum area of approximately 700 sq. in. (It is a worthwhile observation that all minimum ships, particularly in the smaller classes, were dangerously hot to handle and, in some cases, actually impossible to design.) If we assume that our theoretical *Ohlsson 60* airplane is to be designed according to a 120 oz. power loading rule, the ship then would have to weigh in at 72 oz. or more. And if we used the old wing loading rule of 7 oz. per 100, as a yardstick, our wing area would come out at approximately 1028 sq. in. At an aspect ratio of six to one this means a span, on a rectangular wing, of 6-1/2 to 7 ft., depending on tip shape. This ship would have excellent gliding ability, particularly if not burdened with the drag of a minimum crossection or an external landing gear. It would be less prone to spiral dive smashups. And as a matter of fact, if power loading is increased to 120 oz. and wing loading stands as before, it is the ship you will be building for next year!

What would be the effect of increasing the power loading to 120 oz.? To begin with, 120 oz. sounds like a lot of weight to anyone who has been flying at 80 oz.; in fact it is a 50% increase. But all evidence known to the writer indicates that 120 oz. is by no means as drastic as it sounds. We spoke to Chuck Hollinger about his *Sea Hawk* at the Nationals. Though this airplane was designed to 120 oz. power loading it had no difficulty getting up and going out of sight with the best of them. In fact, Chuck placed high up in his event. Back in the northwest, he told us, such highly loaded ships frequently beat the 80 oz. jobs and on at least one occasion finished in one, two, three order. He reports that more care is required in design, especially where props are concerned. It is not practical to throw any club on the engine and expect results. Bob Cahill, one of the old masters in rubber, writes that he is flying a big job with an *Ohlsson 23* and finds that it takes 140 to 160 oz. to get a mild sport performance. Another builder we know of replaced an *Atwood* with a *23* and gets two minutes! Elbert Weathers, on the Coast, has long been known for fantastic wing loadings of 16 and 18 oz. Things like this lead me to suspect that 120 oz. power loading will prove less of a change than hoped for, especially on new ships designed to such rules.

The writer believes that an airplane designed to the old wing loading (even if no rule existed), and the new power loading, could be a ship of terrific performance. What little it might lose on power, it would more than make up for in the glide, perhaps provided that the design remained reasonably clean. If no crossection or landing gear is required the airplane would be nothing more than the *Pencil Bomber* all over again. It would be a better ship from the control standpoint, perhaps a mite less potent under power, but even better in the glide. That it would never want to come down is obvious.

As long as no flight limit is imposed, these airplanes would be flown all out, gambling as usual on the hope of placing. No one will use a dethermalizer when they have to shoot the works to win; otherwise they would not be out there trying in the first place. With a flight limit it is likely that dethermalizers would become commonplace. Although we have had little faith in dethermalizers, and realize that a good thermal will take

(*Turn to page 72*)

AIR WAYS

NEWS OF MODEL AIRPLANE EXPERIMENTERS ALL OVER THE WORLD

TRUE PROFESSIONALS. The controversy over amateur vs. professional has raged in many sports fields and is currently becoming quite intense in model aviation. Primarily the biggest uproar over the so-called professionals seems to center around the control line flyers.

Up until now a model airplane professional was understood to be anyone actively connected with the model plane industry, whether he be manufacturer, dealer or wholesaler. Some talk has been heard that the strictly hobby flier, after he has won two, three or any other agreed upon number of contests, would automatically be shifted to the professional class and not allowed to compete again in the amateur category. Quite a few meets run during the past season have had Professional classes in addition to the usual Junior, Senior, and Open groups.

Now, however, we hear of an undertaking which recognizes the professionals for what they are, and in which there will be no question of amateur vs. pro. An exhibition of model speed and stunt flying was held recently in Philadelphia. Well known modelers were invited to attend and put on a show for the crowd, their only compensation being that travelling expenses were paid. An admission of $1 was charged for spectators and a good sized crowd was willing to pay this much to see the show.

This event was frankly run as a trial balloon to see how the idea would go with the general public, and the participants—who enjoyed the fun as much as the spectators—got nothing for their pains except the expense money noted above. Thus, by the rules of most other types of sport, they didn't alter their "amateur" status.

It is quite conceivable however that this idea will blossom into a true professional class, the participating fliers receiving regular salaries for flying their models in front of the crowds, just as do pros of any other sport. Thus we have the possible beginning of a true professional class. (NOTE: for other news of the amateur-professional controversy, see Al Lewis' "Model Airplane Newsletter," p. 6.)

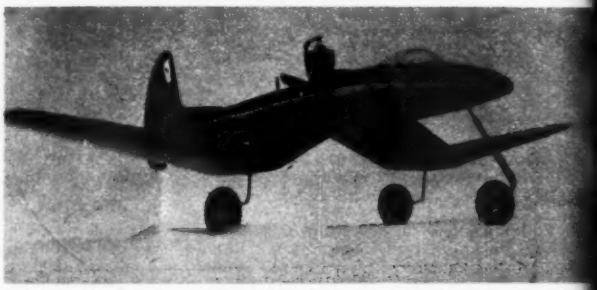
DELAYED TROPHIES. We received a letter from a Milwaukee resident who brings to light a condition which unfortunately is not isolated to his one case. This correspondent states: "On August 3, I won 2nd place in Senior Gas, Class B. I was awarded some merchandise and a certificate telling me the trophy I was supposed to get would be sent to me by mail soon after. Three weeks passed and I had not received the trophy. I wrote a card to the club asking about it and didn't even receive a reply. Now, almost seven weeks have passed and still no trophy." Here is certainly a case of very poor public relations work on the part of the club that held the contest. Presumably they will want to hold further meets next season, but by that time the unsavory news about the group will have been spread far and wide, and you can well imagine what the attendance at their next meet will be.

It takes but a moment and costs next to nothing to send out penny postcards to the trophy winners, advising them of actual delays in delivery, etc. Even if the club finds itself in the red, or unable to supply the trophies for any other good reason, the trophy winners would feel much more kindly disposed toward them if the meet organizers wrote an honest letter of apology.

HYDRO FLYING. In connection with the 5th Annual Championships for Hydro Flying, held in October at Hampton, Va. by the *Brain Busters*, a very attractive little booklet entitled "Hydro Tips" was prepared to help those who were unfamiliar with this form of model activity. It contains many pictures, drawings and several charts showing the uninitiated

(*Turn to page* 36)

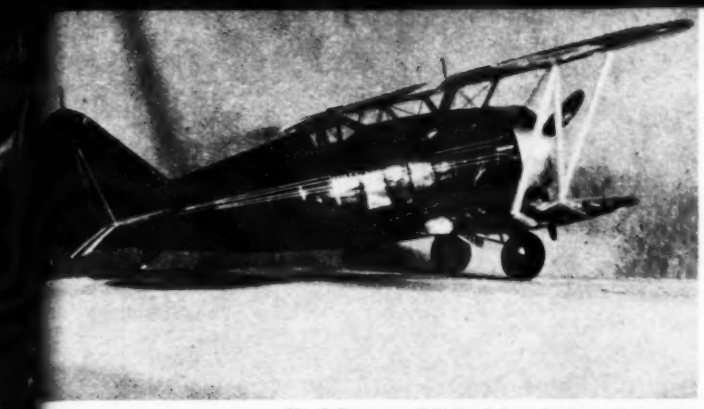
No. 1 20" control line model built by Mr. & Mrs. Albert M. Baird



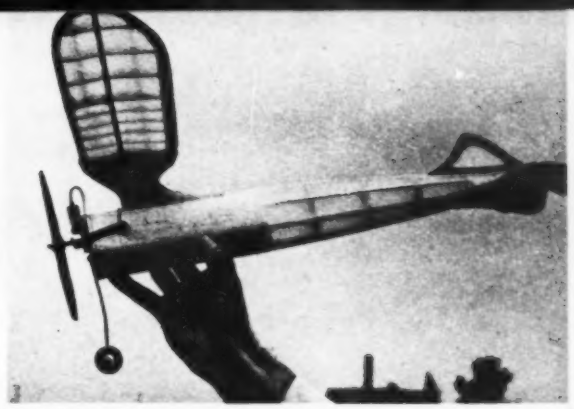
No. 2 L. W. Christensen's control liner

No. 3 The Fokker E-I by W. W. Salsig

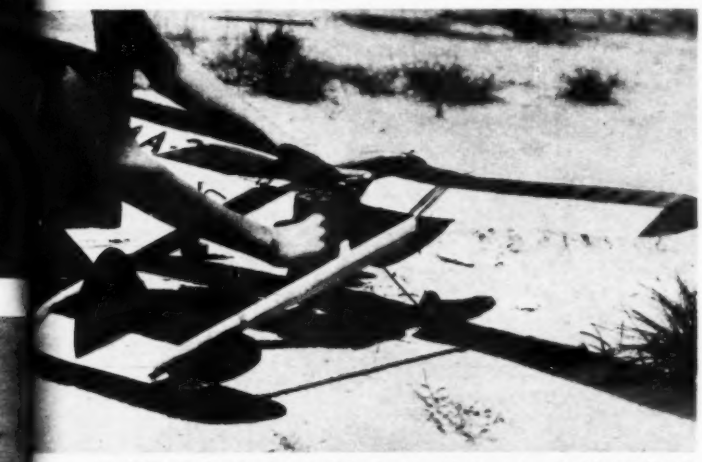
No. 4 Free flight Stinson converted for control line flying



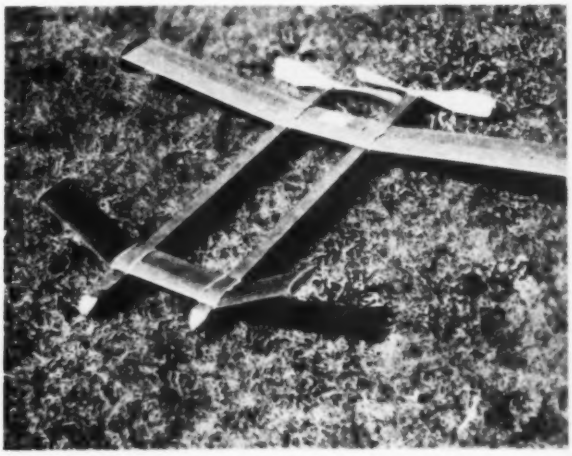
No. 5 Grumman *Gulf-Hawk* built by Louis Heinzerling



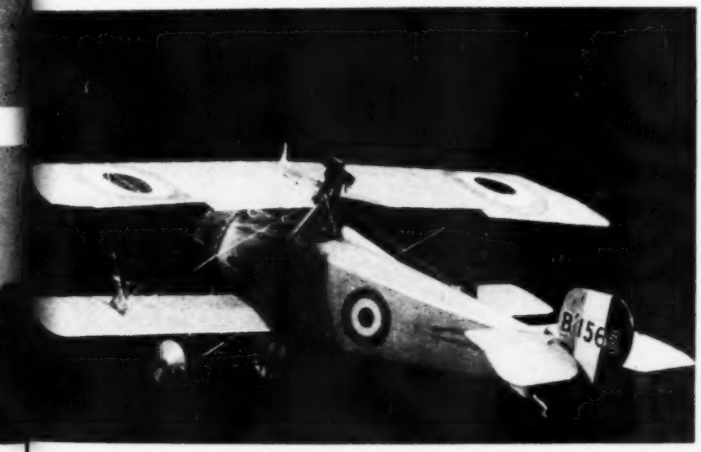
No. 6 *Peanut Pylon* by Noble D. Carlson



No. 7 The *Pusher Sportster* built by Ben Venable from plans in July '47 M.A.N.



No. 8 Ray Prouty's Modernized version of the old twin pusher

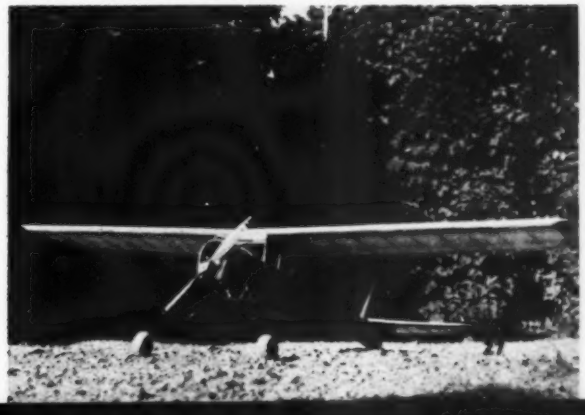


No. 9 C. Bernard Maycock built the model of Col. Billy Bishop's Nieuport 17

No. 10 Stan Stufflebeam's Class A model

No. 11 Towline glider built by Fernando J. Rueda

No. 12 *G.P. Special* free flight monoplane by K. A. Janson



"THUNDERSTICK"
CLASS "D" RUBBER-POWERED STICK
DESIGNED & DRAWN BY "GABE" BEDISH
ASSEMBLY VIEW
SCALE — 4" = 1"
PYLON MOUNT DETAIL
1/16" SH. PLANKING
1/8" SH. GUSSETS
WING DOWEL MOUNTING
HINGE PLATE
.043 COPPER WIRE
FRONT PLATE .043 BRASS
PROP HUB DETAIL
BIND HUB WITH THREAD & GLUE
RETAINER
1/16" PLYWOOD
1/4" SH. PINE
PLUG
B.B. WASHER
ST. SPRING
SOLDER WASHER TO WIRE
1/8" ST. WIRE
1/8" I.D. ALUM. TUBING
LEAD COUNTER BALANCE
NOSE PLUG DETAIL
FULL SIZE
NOSE FAIRING STRINGER — FULL SIZE
REAR MOUNTING DETAIL
1/8" DOWEL
1/16" PLYWOOD
PLATE ONE
W-1
W-2
W-3
W-4
WM
P-1
P-2
P-3
P-4
P-5
R-1
R-2
R-3
R-4
R-5
S-1
S-2
S-3

THUNDERSTICK

by GABRIEL BEDISH

THUNDERSTICK is an attempt on the part of the designer to work out a high performance, compact and stable flying class D rubber powered stick model, embodying a wing design rarely used on most rubber jobs today. This wing design is of the low aspect ratio variety with an elliptical shape. The design proved to be a very potent flier, surpassing in performance many planes embodying the widely used high aspect ratio design.

Many modellers, including myself, have missed placing their ship in a contest because of warping of the flying surfaces on the field of battle. This reaction is always a nemesis on those hot, sunny days accompanying summer contests. A slight warp in the wing can lead to disastrous results in the performance of a model.

By using a low aspectratio wing design this warping tendency can be minimized. A small, easy to transport, lightweight and strong wing planform was the result, which in turn enabled the designing of a model of high flying potentialities.

Proof of these potentialities will be apparent to anyone constructing the *Thunderstick* and applying a knowledge of proper adjustment. However, the plane is by no means a tricky flier. The original flew right off the workbench.

CONSTRUCTION—The first step is to scale up the plans to full size dimensions. A good straight edge, a sharplypointed pencil, an eraser and a sheet of store wrapping paper are the necessary items. Curved portions of the outlining pieces have been drawn to full scale to simplify construction and insure an accurate product.

FUSELAGE CONSTRUCTION—The fuselage is of the conventional diamond shape, blending into a spinner to streamline the flow of air along its lines in flight.

Construct the two fuselage sides, one directly over the other, to assure perfect alignment. Use four strips of equally hard 1/8" square balsa for the fuselage longerons, and 1/16" x 1/8" balsa strips for the crosspieces. After the glue has thoroughly dried, the two fuselage sides may be separated and the crosspieces inserted to complete the fuselage diamond. Next plank in the nose with 1/16" balsa sheeting, and the rear motor mounting with 1/16" plywood.

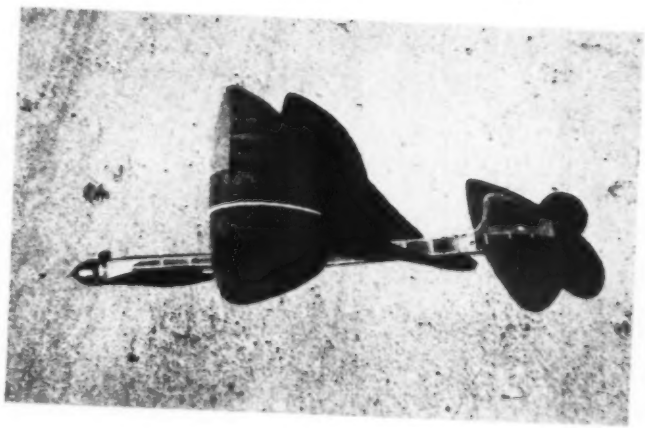
The fuselage pylon is laid out directly over the plan and is built up of 1/8" hard sheet balsa. The rubber retaining hooks for the wing are now set in place. Use 1/16" birch dowel for these hooks. Trim the pylon top to fit the underside of the wing airfoil. Then bend and fasten the wing mount in place. Attach the pylon to the fuselage as shown in the detail drawing on the plan sheet. Use plenty of glue in assembling this joint to provide security against any mishaps and possible mishandling the model may have.

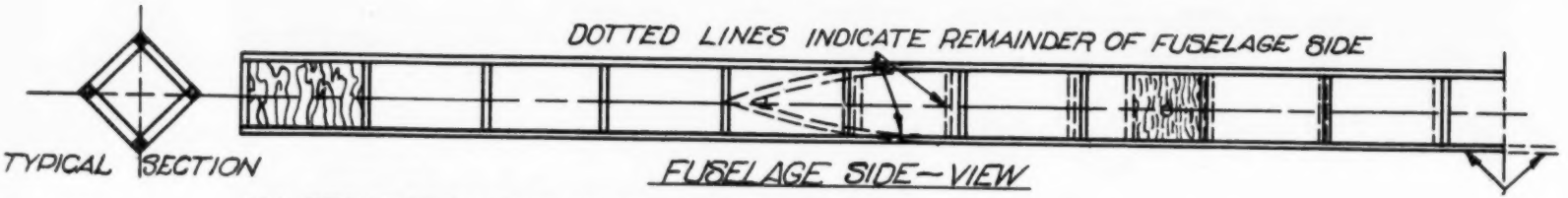
Now set into position the nose plug retainer and its fairing stringers. Reglue all the fuselage joints to strengthen the construction.

WING ASSEMBLY—*Thunderstick's* wing utilizes a sparless, partially planked type of construction which is very strong, yet light and efficient.

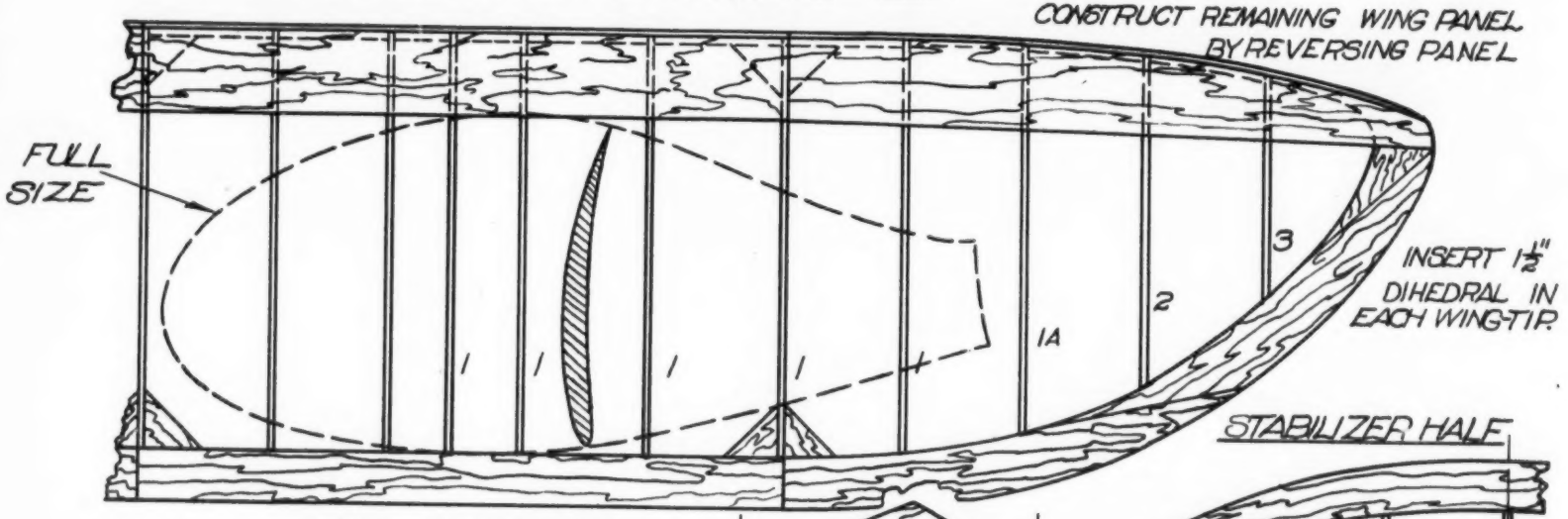
In constructing the wing, first cut all ribs and outline pieces and prepare them for assembly. The outline pieces are of 1/8" medium hard sheet balsa, while the ribs are of 1/16" sheet balsa of the same texture. The leading edge is of hard 1/8" square balsa. Place the outline pieces together in their respective positions, then put the wing ribs in place; best results are obtained by constructing the wing in one unit. After this portion has thoroughly dried, remove from the plan and cut apart in the indicated positions. Then the proper amount of dihedral is inserted into the wingtips. Use medium hard 1/16" sheet balsa for the dihedral

(*Turn to page* 47)





ALL DRAWINGS ON THIS PLATE ARE HALF-SIZE

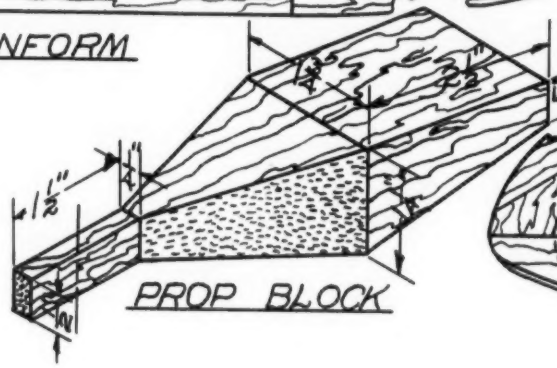


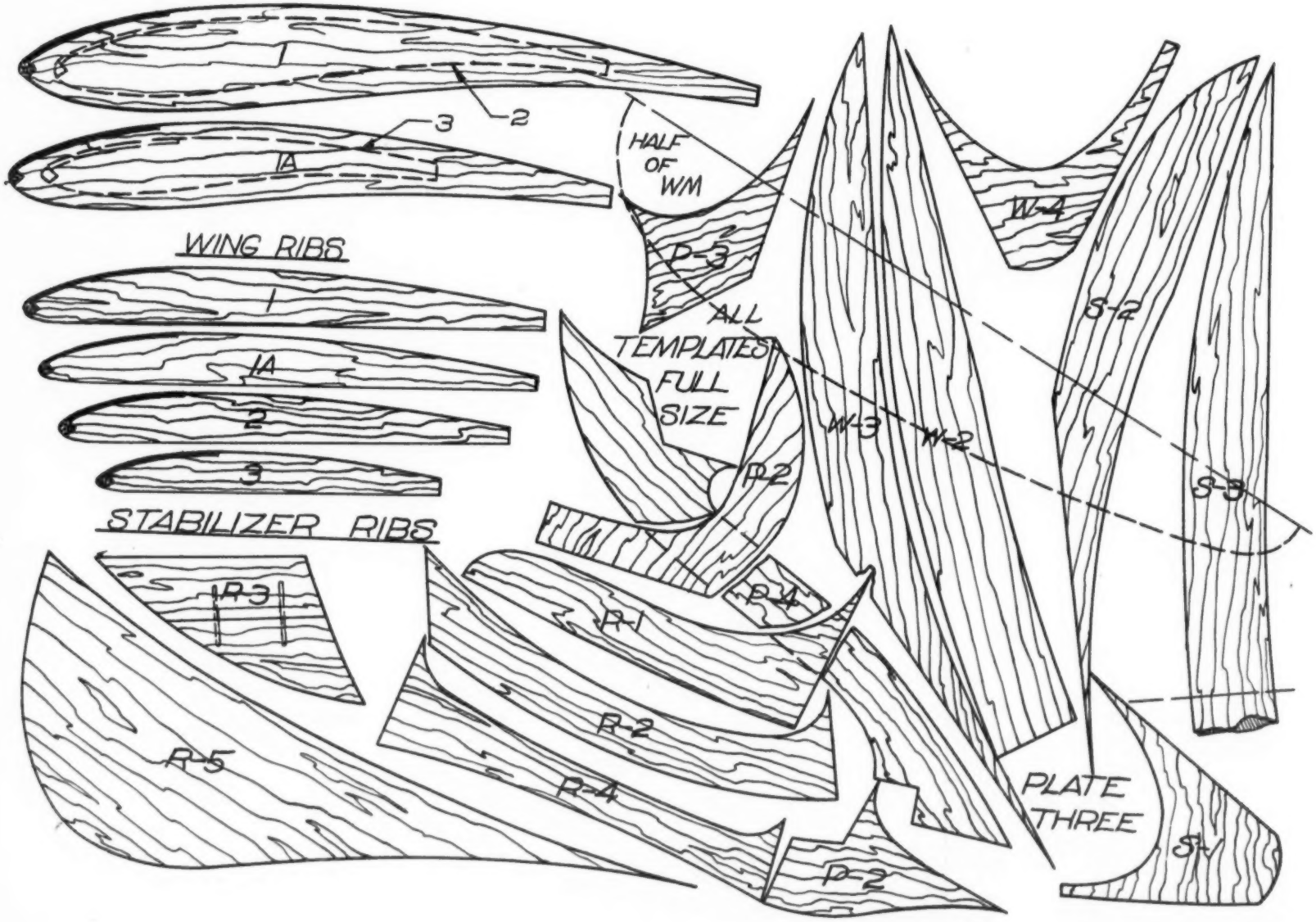
WING PLANFORM

SPECIFICATIONS

WING SPAN——24"
" " AREA——120 SQ."
FUSELAGE LENGTH—25"
WEIGHT——3.5 oz.
PERFORMANCE=PHENOMENAL

PLATE TWO




3
2
1A
HALF OF WM
WING RIBS
1
1A
2
3
STABILIZER RIBS
R-3
R-5
R-1
R-2
R-4
P-3
P-2
P-4
ALL TEMPLATES FULL SIZE
W-4
W-3
W-2
S-2
S-3
PLATE THREE
S-1
P-2

DIESELS GROW UP

Operational hints and general information on so-called "ignitionless" motors

by JACK BAYHA

WHEN we wrote "The Care and Feeding of Diesels" (MAN June 1947) a diesel engine was a curiosity—now they are taken for granted. These tiny engines with their diet of ether have fast grown up and have shown they have what it takes. The lack of ignition trouble, and the general simplicity of operation are the diesels' biggest advantages. We have been flying solely with diesels since that time, and have tried out every engine we could lay our hands on; on those not actually used we've learned as much about as possible.

We've actually flown with the *Drone, Mite, C.I.E., Movo* and the newest entry in the diesel field, the *De Long*, and have been in contact with the makers of the *Edco* and the *H & H*, to secure full information on them. We've tried the diesel out in race cars, boats and U Control models, and also tried out one in a free flight model. This just about covers the field (what, no railroad trains, you say—well if you think I want a diesel locomotive running around my living room . . . !)

All our diesels may be broken down into two major groups; we have variable compression engines, and fixed compression ones. An illustration is given which shows the general construction of each type. The *Mite, Drone* and *Edco* are fixed compression engines, as is the *H & H*. Although the *H & H* is not considered a diesel by some people, we'll explain this later. The *Movo, C.I.E.* and *De Long* are variable compression engines. And to further confuse the issue, there are both variable and fixed compression heads with which the *Arden* engines may be changed to diesel operation.

The makers of the fixed compression engines will tell you that variable compression engines are more complicated to run. The variable compression men claim the same for fixed head engines. Suppose we look at each type, with its advantages and disadvantages; let's take the fixed compression ratio first.

Here we have only one adjustment, a needle valve which controls the air and fuel mixture. This admittedly makes a simpler system, but if the head was not properly set at the factory trouble can be experienced with both starting and running. As the engine wears (and diesels *will* wear, though at a much slower rate than gas motors) the compression may drop. In the case of the fixed compression engine nothing can be done—so some say. Actually, this is not quite the case.

The compression ratio of a "fixed" compression engine can be adjusted. One way is to remove and lower the head by removing gaskets, etc. A much simpler way is merely to add more oil to the fuel. This may seem like the wrong approach, but we'll explain. As oil is added to the fuel it causes a heavier mixture to enter the head. It has more oil and of course this oil does not burn to any great extent. Since we have a considerable amount of oil, which is incompressible in our mixture, we have less room for fuel and an apparently higher compression ratio results. When a diesel starts acting as if it was always too lean, no matter how far you open the needle valve, try adding oil. The addition of oil will usually bring the compression ratio up to an operable point. Use of a heavier grade oil will sometimes do the same thing.

Now let's look at the variable compression ratio diesels. In this case we have two pistons in our

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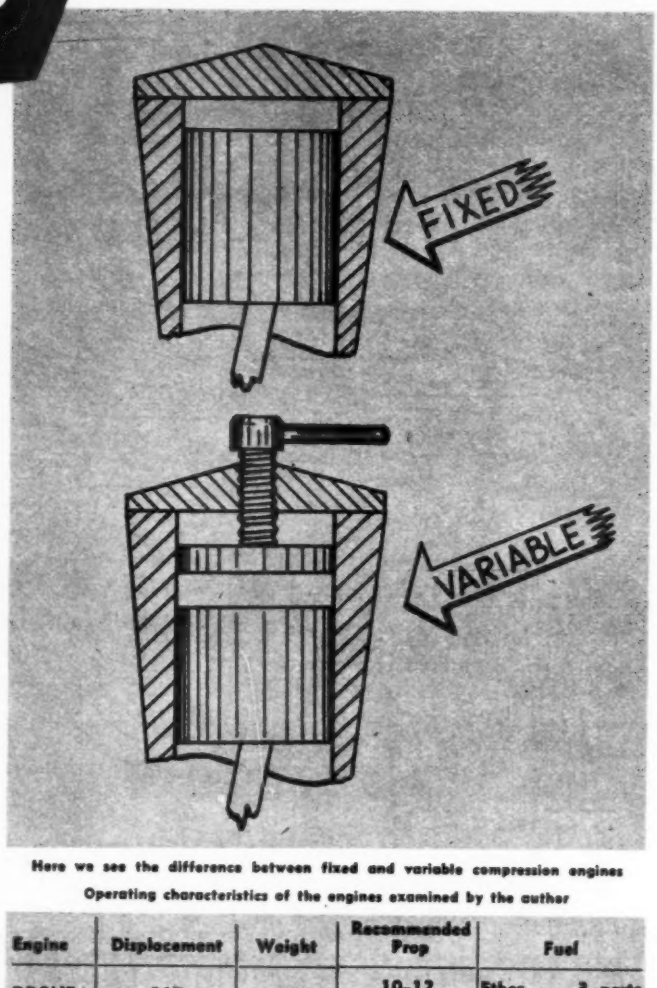

Here we see the difference between fixed and variable compression engines

Operating characteristics of the engines examined by the author

Engine	Displacement	Weight	Recommended Prop	Fuel
DRONE	.207	9.5	10-12 11-10	Ether 3 parts SAE 20 oil 1 part
MITE	.099	2.6	8- 8	Ether 1 part SAE 20 oil 1 part
MOVO	.200	6.1	10- 6	Naphtha 5 parts Ether 5 parts Mineral oil 3 parts
C.I.E.	.144	6.25	9- 6	Ether 1 part White gas 1 part SAE 40 oil 1 part
H & H	.450	7.9	9-10	Alcohol 3 parts Castor oil 1 part
DeLONG	.299	8.5	10-12 11-10	Ether 3 parts SAE 20 oil 1 part
EDCO	.450	.....	12-10	Ether 3 parts SAE 20 oil 1 part

All weights in ounces . . . Prop diameter first followed by pitch.

WEST COAST TIPS

by JOHNNY DAVIS

LAST month we said that when the Nationals results were official we would give you the dope on Westerners. Well, here it is. The contest committee had 21 protests to consider and that undoubtedly took some time.

Frank Cummings won the National Championship and the Cub Trainer which was the sweepstakes prize. Also, Bill Tharp was finally allowed to receive his Stout Outdoor Trophy.

Incidentally, here is the list of the *Thermal Thumbers'* Winning Team, including alternates: Frank Cummings, Andrew Peterson, Bob Holland, Bill Atwood, Bill Lopez, Don Donahue. Other *Thermal Thumbers* also present at the Nats were: Joe Mechal, Yuji Hirose, Ralph Conn, Bill Sweet and Johnny Brodbeck.

California managed to garner 34 places in the National meet: 12 firsts, 12 seconds, and 10 third places, for which we will gladly settle, thank you.

Of course the two outstanding performances were turned in by Frank L. Cummings and Keith H. Storey. Frank won both the Western Open and National Sweepstakes and is our nomination for modeler of the year. Keith very nearly beat Frank out and only flew twice. This because both times he flew he set new A.M.A. speed records (in classes III open and V open)—and all this, mind you, with not even one practice flight.

The *Oakland Cloud Dusters* also covered themselves with glory at this year's Nats, running second to only the *Thermal Thumbers* in numbers of points amassed. Incidentally, we have a report on hand from "Mom" Robbers concerning the 4th Annual San Francisco meet, wherein the *Oakland Cloud Dusters* sort of took over the rubber powered and glider events as follows:

1st place, Jr. Towline Glider: Don Robbers 4:19.9

2nd, Jr. Towline Glider: George Matsumoto 1:49.0

1st, Sr. Towline Glider: Peter Demos 7:09.5

1st, Jr. ROG Cabin: George Matsumoto 3:28.4

3rd, Sr. ROG Cabin: David Gilbert 5:30.2

A visiting Chicago Aeronut, James Tangney, placed second in Sr. R. O. G. Cabin, with 6:12.0.

* *

THE California Association of Model Clubs held a State meeting Sept. 21 in Fresno, to forward recommendations to the A.M.A. contest board concerning rules for '48.

We urge all California clubs to join the C.A.M.C. as soon as possible. It was our experience at the Nats that California and the Coast have become far more prominent than our representation at past contest rules meetings would indicate, and if we unite now, we can have a real say in getting the kind of rules set up that we want to fly under. The C.A.M.C. is our white hope of power, so join right away. For information, write to: Ocie Randall, Temporary Chairman, 716 Waterman Ave., Fresno; or to Myrtle B. Robbers, 5619 17 St., Oakland if you live up north. If you live in southern California get in touch with Lee Galloway, 1710 Brighton St., Burbank.

* *

Okay kiddies, put on your asbestos suits, it's gonna get hot now!

EAST-WEST MEET

We have already covered the East-West Meet in last month's issue, as far as the contest itself and the contestants are concerned. Enough cannot be said for the Greater St. Louis Club's efforts on behalf of both visiting teams, and the sportsmanship which was displayed on the field. Nobody ever fought a gamer losing battle than did those grim Easterners—we salute them, one and all.

But we are sorry we can't say the same for other people from the East who promised big things which did not materialize. We feel very strongly concerning the inadequate way in which the pre-contest arrangements were handled in the East. We do not refer to any committee that may have been set up to rectify this matter, but to the condition which created the necessity for a committee.

Charles Bowman of Berino, N. Mex. with McCoy 49 Speedster. Though living 24 miles away, he always manages to be on hand for *El Paso Miniature Motors* Club activities

We won't say any more. We know we are fully understood by all who were present at the meet. This is the closest to a public spanking that we can give. (It will probably be censored by Ye Olde Edde, anyway, but those are our sentiments, gang.)

(No it won't, Johnny—your impressions merit airing.—Ed.)

* *

Marvin Crawford and his *Anaheim Balsa Butchers* can claim to be the most snakebit model club in existence. So far they have scheduled two large contests several months apart. On both occasions, Jupiter Pluvius decided to cloud up and cry all over the place. And this in the land of super sunshine, too. These boys have probably the finest model control line site in these United States in which to throw their meets, but so far the weatherman has frowned them down. Their site is a regulation ball park, right in the center (almost) of Anaheim. The field itself is beautifully kept up and the grass is trimmed nearly flush with the ground. There are nice bleachers for the spectators and adequate facilities for refreshments. Lights are available, we understand, if a contest runs over.

Besides having a swell place for a meet, Marv and his boys really run a meet right.

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Herman Young of *El Paso Miniature Motors Club* shown with an old challenger. Herman is the top El Paso stunt man

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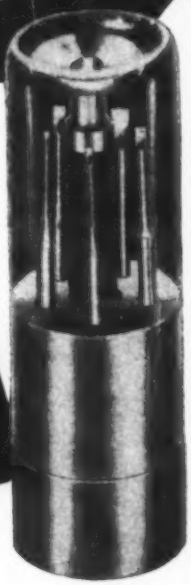

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1/16x1/2	3c
3/32 sq. 3 for	4c
3/32x3/16	2c
3/32x1/4	2½c
3/32x3/8	3c
3/32x1/2	3½c
1/8 sq. 3 for	5c
1/8x1/4	2½c
1/8x3/8	3½c
1/8x1/2	4c
5/32 sq.	1½c
3/16 sq.	2c
3/16x1/4	3c
3/16x3/8	4c
3/16x1/2	5c
3/16x5/8	6c
1/4 sq.	3½c
1/4x3/8	4c
1/4x1/2	6c
1/4x5/8	7c
1/4x3/4	8c
5/16 sq.	5c
3/8 sq.	6c
3/8x1/2	8c
1/2 sq.	8c
3/4 sq.	15c

SHEETS

1/64x2	8c
1/32x2	8c
1/20x2	8c
1/16x2	8c
3/32x2	10c
1/8x2	10c
5/32x2	12c
3/16x2	14c
1/4x2	16c
5/16x2	18c
3/8x2	20c
1/2x2	22c
1/32x3	10c
1/16x3	12c
3/32x3	15c
1/8x3	19c
3/16x3	22c
1/4x3	25c
3/8x3	30c
1/2x3	35c

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1x6	90c
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10x1x1-1/2	10c	18x1-3/4x2	32c
12x1x1-1/2	12c	9x1-1/2x2	15c
14x1-3/16x1-3/4	18c	10x2x2-1/4	25c
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Silkspan GM 10c. 3/25c	
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Balsa Props, 4"-4c, 5"-5c, 6"-6c, 8"-8c, 10"-10c, 12"-12c, 14"-16c	
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Control Wire, 100' .010, .012, .014, and .016, .140	65c 75c
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2½"	.50
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Model Airplane NEWSLETTER

by AL LEWIS

AMONG the subjects we reported in past columns are two that received a mixed though lively reception: "professionalism" in modeling; and a trend towards stunt and scale model flying and away from straight U-control speed flying. From the numerous letters received, we selected two typical ones for comment here.

From Los Angeles—the birthplace of excellent speed, stunt and scale model U-control flying—comes the first letter written by A.M.A. member Tom Bucholz; also signing the letter is R. C. Bucholz, Tom's mechanic-helper:

"My son, with great indignation, asked me to read Al Lewis' *Newsletter* in the September issue of M.A.N., especially that portion wherein this 'microfilmer'—an A.M.A. official—gives evidence that he, at least, should curb his expressed personal opinion to the end that he is impartial. It is my feeling that the published remarks of an official of any governing body should be tempered with caution, or should that official be prejudiced to one style of plane or technique he should keep his opinion to himself or offer no comment detrimental to other fields than his own."

First, Mr. Bucholz, by calling me a "microfilmer" you have paid me a high compliment, one I am unworthy of. If you wish confirmation of the fact that indoor microfilm is the most exacting of all model plane categories, the one that demands the best ability and knowledge—bar none—I respectfully refer you to your nearby neighbors: 1947 National Champion Frank Cummings, Jr., motor designers and manufacturers Ray Acord and Bill Atwood. As for being an A.M.A. "official", the writer resigned as Executive Director of the Academy in October 1946. Today I am merely one of almost 1,000 "leader members."

Mr. Bucholz continues: "Mr. Lewis states that the major interest is in precision—noting a meet which was held at Elizabeth, N.J., under the auspices of Levy Brothers—a store. It is readily understandable that interest in speed was lacking, if there was no speed—Mr. Lewis fails to mention where the monotony ends and speed begins. Out here, under 112 mph is just flying—and we don't mean Classes 4, 5 or 6. If he is correct, any controliner should know who is national precision champion—or do the names Babcock, Newberger, Storey, Wallick and Kitchens come more readily to mind?"

The Los Angeles enthusiast seems to be indicting Levy Brothers as a sponsor because it is a store. Would that there were 2,000 more sponsors like that establishment! No admission charge to meet for flyer or 16,000 spectators; free snacks for the flyers; excellent prizes; a well run meet in a sheltered municipal stadium; smooth, grass turf on which to fly!

This store has run two of the outstanding control line meets in the East. In each contest the best awards were for speed—yet at the '47 meet the precision boys stole the show. Yes, we know of the hot-shot speed boys and admire their performance, but in most parts of the country speedsters also fly stunt and scale ships. And when we think of famous control line fliers, Mr. Bucholz, we also include Slagle and Yates, Mayes and Greene.

Says Mr. B: "We have some precision boys, too—Gullota, Landsberg, Slagle, Yates and Palmer, also the Snafu team—but we or they do not share Mr. Lewis' opinion that all stunt flyers are crazy or all speed flyers are nuts."

Such is not our opinion, sir. Speed has

(*Turn to page 51*)

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15 SYNCRO FEATURES

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So you may order with complete confidence, read this Liberal SYNCRO TRIAL OFFER! When you get your saw, plug it into any 50 or 60 cycle A.C. only, 110-120 volt outlet and saw according to instructions. Then if it does not satisfy you perfectly in every way, return it postpaid within 10 days of delivery date, and we will refund your $17.50 promptly without questioning.

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Mail coupon with Postal Note, Money Order or check for only $17.50 plus Parcel Post or Express carrying charges . . . or . . . send $17.50 only and we will ship saw collect for Parcel Post or Express carrying charges only. Specify type of delivery on Coupon. Shipping weight, packed, 18 lbs. Hurry! Act promptly—order—we'll ship same day order is received. (No complete COD orders accepted.)

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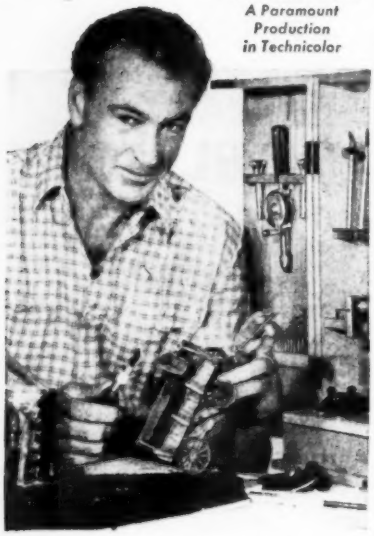
A Paramount Production in Technicolor



Whoa there, fellers!

Best way to brake the pellmell pace of modern living is to ride a hobby hard, says film star Gary Cooper. *His* sport is carving model scenes of the olden, golden West... And as a super-duper craftsman, Gary hoop-las for X-acto... "the slickest bunch of hobby tools" he's ever seen. Scalpel-sharp, sure and accurate, X-acto tools are favorites with beginners as well as with expert craftsmen.

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Air Ways

(*Continued from page 26*)

how to design floats for almost any kind of contest model.

The *Brain Busters* are past masters at hydro flying and feel, as do most other modelers who have tried it, that flying a float model off water is just about tops in model thrills.

We hope the *Brain Busters* have a few extra copies of "Hydro Tips" that they can send to modelers who are interested in this activity, but who were unable to attend the 5th Annual Hydro Championships.

* *

Picture No. 1 shows a 20" control line model submitted by Mr. & Mrs. Albert M. Baird of Lyndonville, N.Y. Mrs. Baird proudly displays the model which she and her husband built together. Several unusual features are: a hand turned mahogany fuselage, aluminum cowl and deluxe enamel finishing.

The result of L. W. Christensen's (518 E. 134 St., Hawthorne, Calif.) first attempt at building a control line job is shown in No. 2. The construction is standard but the unusual feature of this model is the location of the motor and propeller. Tests have not yet proven how successful this will be.

W. W. Salsig, Jr. (2539 Ellsworth St., Berkeley 4, Calif.) decided to build a model which could be converted from an exhibition to a flying model; the Fokker E-I in No. 3 built to 3/4" to 1" scale resulted. He substituted a dummy motor and motor tube for the scale engine and prop, changed both elevator and rudder to units of the same geometry but considerably larger, pushed the wings up to proper dihedral, and there was a flying scale model that actually performed well. All components used for flight were designed according to Grant's formulas: for example, scale elevator area (to 3/4" scale) was 9-1/4 sq. in., while flying elevator required 19-1/2 sq. in. In flight, the model didn't skyrocket like most rubber jobs but climbed at a rational 15°-20°. It wouldn't win an endurance contest but the 30-45 seconds it was in the air proved it to be very realistic, stable and well behaved.

No. 4 comes from Sherman W. Schultz, Jr. of St. Paul, Minn. This free flight Stinson was converted for control line flying. To date it has had 45 flights and no broken parts. The model is powered with a *Super Cyke*, which has enough pep to make it very realistic in flight. It weighs 6-1/2 lbs.

Louis Heinzerling (Monroe, Mich.) sent in No. 5 of his Grumman *Gulf-Hawk*, built from a kit but with many changes. All controls including rudder trim tab and adjustable stabilizer are movable from the cockpit. The main landing gear and tail wheel are retractable from the cockpit, the fuselage is built of balsa and sheet covered with thin aluminum over this, and all rivet rows duplicated. The wings are built up and silk covered.

The *Peanut Pylon* in No. 6 was submitted by Noble D. Carlson, 960 Beverly Rd., Cleveland Heights, Ohio. Span is just 28", and length 18". It is his eighth original design for the CO2 motor, and is as small as he found he could make without getting too hot a ship. High time to date is 4 min. 33 sec. Mr. Carlson obtained four flights consecutively of over 3 minutes each with no thermal assistance whatsoever, flying in the evening, with the last flight completed in the rain. Glide is excellent, in spite of the built-in headwind.

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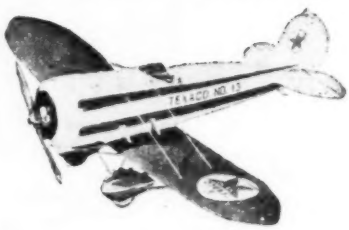

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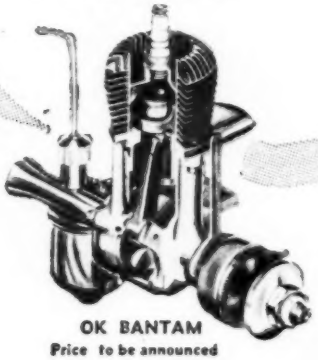

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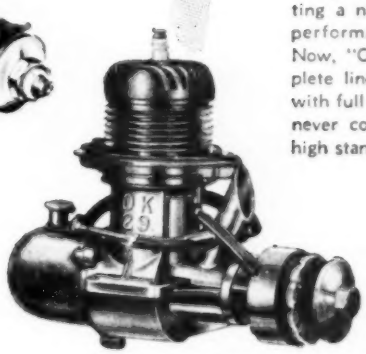

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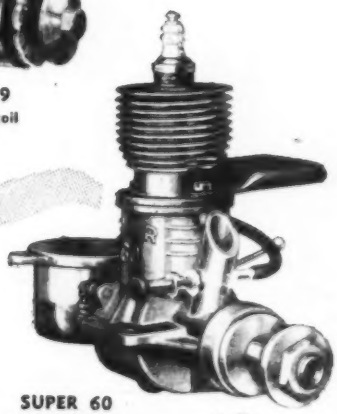

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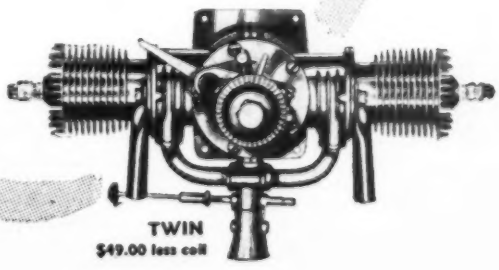
Super 29	B	.299	.760	.660
Super 60*	C	.604	.900	.950
Twin	C & Exp.	1.208	.900	.950
CO_2	—	.0178	.275	.300

*Super 60 also available in Raceway-Marine model equipped with flywheel. Price $23.00 less coil.



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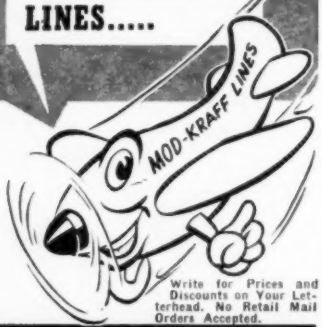

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2"	No. 14 .07	2"	No. 26 .10
2½"	No. 15 .08	2½"	No. 27 .15
3¼"	No. 16 .10	4"	No. 28 .20
4"	No. 17 .12	4½"	No. 29 .25
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1 16" ..... .12
3 32" ..... .12
1/8" ..... .12

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The *Pusher Sportster* model built by Bill Venable (810 S. Ingraham Ave., Lakeland, Fla.) from plans in the July 1947 issue of MODEL AIRPLANE NEWS is shown in No. 7. It had not yet been flown at the time the picture was taken.

Ray Prouty (Pullman, Wash.) sent in No. 8, a modernized version of the old twin pusher. It is a 200 sq. in. job. The props are 12 inchers and each motor is 14 strands of 1/8" flat rubber. So far he hasn't been able to get much of a glide out of it, but the motor run is about a minute so flights are at least that long. At Spokane he was extra cautious about winding and only got a three flight average of 47.2 sec., which was good enough to win second place in the Open event.

From Barnet, Herts, England, C. Bernard Maycock sent No. 9 which is a model of Col. Billy Bishop's Nieuport 17 of World War I fame. All controls are movable from the cockpit and it has a demountable machine gun as in the prototype, the scale being 1/2 in. to the foot. The cowling was formed from a piece of sheet zinc spun over a wooden former, and the joint soldered. The fuselage was made in two halves split longitudinally. The wings were cut from the solid and strips of drafting tape spaced on to represent the ribs. The whole was then covered with tissue which when doped gives the effect of fabric covering, besides guarding against splitting. Tires are ordinary Singer sewing machine bobbin winder rubbers, and the axle is suspended as in the prototype. The finish is aluminum cellulose dope all over applied with a brush with hand painted roundels of the correct 1914-18 pattern. The Lewis gun was made from odd scraps of brass, soldered together.

No. 10 shows a Class A model submitted by Stan Stufflebeam of 235—30 St., Oakland, Calif. It is powered by an *Arden .099*, has a wing area of 210 sq. in. and weighs 20 oz. The climb is extremely fast.

One of our "south of the border" friends submitted No. 11. Fernando J. Rueda (San Luis 394, Posadas—Misiones —Argentina) took this photo at the Aerodrome for Motorless Flying at Merlo—F.C.O., during a contest held by the Club Aeromodelista, Buenos Aires. This interesting glider has a wingspan of a little over 60", is silk covered and aluminum painted. It has a deep washout in the tips. For launching, the designer employs a 100 ft. towline and an additional rudder placed underneath the fuselage. This extra rudder gives exceptional stability to the model in towing, always a difficulty with this kind of plane.

No. 12 was sent in by K. A. Janson, Storgatan 49, Linkoping Sweden. It shows his free flight monoplane which has a wingspan of 1860 mm. and is powered by an *Ohlsson 60*. He calls this model the *G.P. Special* and it is certainly unusual in that there is practically no dihedral.

NEWS OF MODELERS

Mac Hyde (Box 247, Ingersoll, Ontario, Canada) writes us that he would like to correspond with other modelers his own age (14-15), especially those interested in control line gas and towline gliders.

Ken Lawrence (643 Ashland Ave., Niagara Falls, N.Y.) is interested in exchanging MODEL AIRPLANE NEWS copies with an English boy who in turn would send the equivalent of our magazine in his country.

Jimmy Napper (P.O. Box 1791, Yuma, Ariz.) would like to correspond with modelers of his age (16). He says they may either be boys or girls as some girls are now becoming good model builders.

Arnold P. Nowell (30 Williams Ave., Hyde Park, Mass.) has twenty issues of MODEL AIRPLANE NEWS published in the thirties that he would like to exchange for other copies of the same decade.

J. Cody (63 Barrington Ave., Chanterlands Ave. North, Hull, E. Yorks, England) is interested in exchanging regu-

(Right) **Members of Greater St. Louis Modeler's Assn. who were hosts to East-West contenders. Standing, left to right: John Dolan, E. Hutchinson, E. O. (Pop) Ellbring, Al Yount, E. Yeager; Kneeling: Gene Winn, Walt Jenkins, Ed Hoermann**

(Below) **Keith Storey presents a trophy to Harry Rice while the Western team looks on. Gent in noisy shirt, extreme right, is M. A. N.'s West Coast reporter, Johnny Davis**

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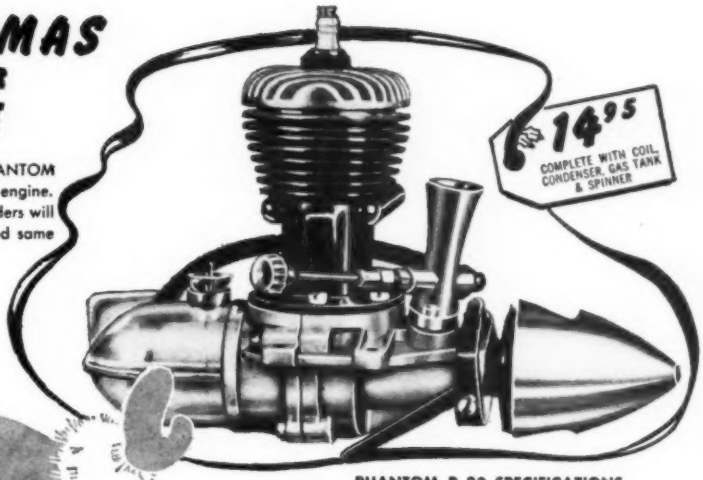

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larly copies of *Helicopter Digest* or similar aviation magazines in return for British publications.

Fernando J. Rueda (San Luis 394, Posadas, Misiones, Republica Argentina S.A.) lost the address of Ted Hindmarsh, a former correspondent of his and would like to renew this letter writing.

Julio G. Dumo (c/o Mr. Teotimo Tolentino, Goodyear Tire & Rubber Co., 15 Atlanta St., Port Area, Manila, P.I.) would appreciate criticism from would-be penpals on the subject of model building. Julio's particular interest lies in rubber powered models—Wakefield designs or other endurance types.

CLUB NEWS

Arkansas

Results of the meet sponsored by Little Rock Exchange Club have just come in. Adverse weather—strong wind and rain during the morning—didn't deter the group of modelers in Little Rock. The winners:

Class A Open—1. J. L. Sadler 2. Bob Hunt.
Class B Open—1. Dr. Warden 2. Ray Shearer 3. Jim Winburne.
Class C Open—1. Dr. Warden 2. Bill Barrett 3. H. A. Thomas.
Class A Jr.—1. Eddy Joe Schwarz 2. Bob McKinley.
Class B Jr.—1. Raymond Shearer.
Class C Jr.—1. Schwarz 2. Chester Hight 3. Raymond Shearer.
Stunt—1. Bob Johnson 2. R. H. Mann 3. Dean Wright.
Beauty—1. Jim Winburne 2. Jim Webb 3. H. A. Thomas.

California

A new control line club, the *Fresno Model Control Flyers*, has been organized. The members meet first and third Wednesdays, 8 p.m., every month at Fresno Tech High School. Officers: Oral Winfrey, pres.; Vester Warner, vice pres.; Paul Nieto, Sec.; Mr. Webster, treas.

* *

San Francisco's Fourth Annual Model Plane Contest, sponsored by Junior Chamber of Commerce, drew a crowd of 30,000 to the Polo Field in Golden Gate Park. The winners:

Jr. Glider—1. Don Robbers.
Sr. Glider—1. Peter G. Demos.
Rubber powered Jr.—1. George Matsumoto 2. Aurilla Doerner.
Rubber Sr.—1. John Tatone.
Gas Powered—1. William "Buzzy" Mackerracher, Jr.
Class B Precision—1. Don Hollfelder.

Speed

Jr. Class A—1. Frank Nickson.
Jr. Class B—1. Peter Gosh.
Sr. Class A—1. W. E. Richards.
Sr. Class B—1. Joe Libonati.
Sr. Class C—1. W. Mathews.

Precision

Jr. Class A—1. Eugene Stiles.
Jr. Class B—1. Don Hollfelder.
Jr. Class C—1. Jack Douglas.
Sr. Class A—1. Ray Regalia.
Sr. Class B—1. Ray Regalia.
Sr. Class C—1. Roy Mayes.

Team Flying award—K. L. Skilling and William Thundberg.
Youngest contestant—Billy Peden Jr., 6 years old.

* *

On October 5, the *Los Angeles Aeromodelers* held their semi-annual U-control contest.

* *

As part of the Fifth Anniversary celebration of the U.S. Army Transportation Corps, the officers and men of Camp Stoneman put on a very good U-Control contest on August 3. The results were:

Speed

Jr. Class A—1. C. Hallum.
Sr. Class A—1. M. Gagnone, Palo Alto.
Jr. Class B—1. L. Mallory.
Sr. Class B—1. E. Huth 2. C. Angwin 3. B. McReynolds.
Jr. Class C—None qualified.
Sr. Class C—1. W. Osborne 2. A. Flanders 3. E. Moline.

Class ABC Jr. Precision—1. B. Thundberg 2. J. Fedracci 3. D. Hollfelder.
Class ABC Sr. Precision—1. B. Hooper 2. E. King 3. F. Bradford.

* **

Results of the Oakland Jr. Chamber of Commerce Contest held August 10 are:

Speed

Class A Jr.—1. Ruark. 2. Banner.
Class B Jr.—1. L. Mallory 2. Ruark 3. Alexander.
Class C Jr.—1. J. Sofilos 2. Lester Douglas.
Class A Sr.—1. W. Richards 2. M. Gagnon 3. H. Albrecht.
Class B Sr.—1. Albrecht & Alexander 2. Joe Libonati 3. J. Kyle.
Class C Sr.—1. Albrecht & Alexander 2. Joe Libonati 3. Al Clarke.

Precision

Class A Jr.—1. "Snuffy" Duffy 2. Bill Thundberg 3. Mortenson.
Class B Jr.—1. Don Hollfelder 2. Bill Thundberg 3. John Harvey.
Class C Jr.—1. Clarence Tyer 2. "Snuffy" Duffy 3. Don Butman.
Class A Sr.—1. Ray Regalia 2. C. L. Bussard 3. R. Griswold.
Class B Sr.—1. Don Vis 2. R. Griswold 3. C. L. Bussard.
Class C Sr.—1. Ray Regalia 2. F. Bradford 3. Ed. Dunkum.

* * *

Connecticut

The Willimantic, Norwich and Putnam National Aeronautic Associations sponsored a meet at Windham Airport on September 21 with the following results:

James Grant, 156-A Collins St., Hartford, was awarded a trophy for highest total of points.
Class C Gas—1. James C. Grant 2. Dan Sobala 3. Dave Hunt.
Class B—1. L. M. Burke 2. Fred Haesche 3. Dave Hunt.
Class A Open—1. O. Bayajian.
Tow Glider Open—1. Frank Chapman 2. Victor N. Lemieux 3. Sune Timour.
Hand Launch Glider—1. Robert Swanson 2. Henry Wojtowitz 3. Mr. Garnett.
Hand Launch Stick—1. Mr. Garnett 2. Stanley V. Colson 3. Mr. Logan.
Cabin Plane—1. R. K. Barber 2. Robert Logan 3. Henry Struck.

Kansas

The *Flying Eagles Hy-Flyer Club* held their annual meet on Sept. 28.

* *

Plane Tips, official publication of *The Wichita Planesmen* report the following results of the Rubber Contest held September 7:

Open—1. Stan Chilton 2. Richard Wallace.
Sr.—1. Kenneth Dunlap 2. Joe Yeager.
Jr.—1. Bill Cushenberry 2. Nelson Gordon.

* *

Louisiana

Following are the results of the Seventh Annual Gulf States Model Airplane Meet, New Orleans:

Hand Launched Glider Jr.-Sr.—1. Harry Weigel 2. Charles Alba 3. Don Devine.
Hand Launched Glider Open—1. H. Boutwell 2. Frank Pedreira 3. G. D. Robertson.
Stick Endurance Jr.-Sr.—1. R. H. Elliott 2. Harry Weigel.

Ernie Babcock Jr. at left and Bill Siedler, two of the Eastern boys, tuning up one of the small jobs at East-West Meet

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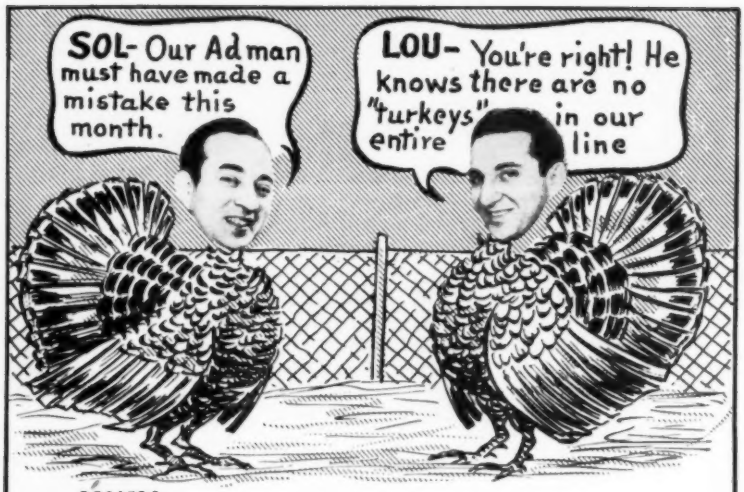

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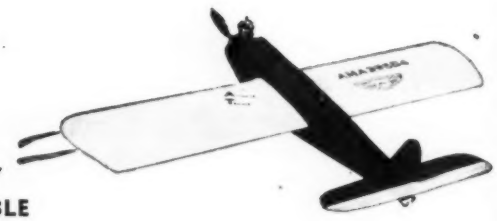

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Cabin Endurance Jr.-Sr.—1. Doyle Duckworth 2. Harry Weigel.
Cabin Endurance Open—1. M. D. King 2. Joe Pedreira.
Flying Scale Free-for-all—1. E. O. O'Donnell 2. M. D. King.
Towline Glider Open—1. F. W. Wench 2. H. Boutwell.
Free Flight Gas Class A Jr.-Sr.—1. Jimmie Green 2. Vernon Weber.
Open—1. Melvin Jung 2. Joe Pedreira.
Free Flight Gas Class B Jr.-Sr.—1. Jimmie Green 2. Harry Weigel.
Open—1. Melvin Jung 2. Philip Roach.
Free Flight Gas Class C Jr.-Sr.—1. Harry Weigel 2. Vernon Weber 3. Richard Nieto.
Open—1. Thomas McLaughlin 2. Joe Pedreira 3. H. Boutwell.
Control Line Class I-II Jr.-Sr.—1. Sam Price 2. Tommy Varnson.
Open—1. Joe Pedreira.
Control Line Closs III Jr.-Sr.—1. Sam Price 2. Sam Beasley 3. Glen Vandiver.
Open—1. Joe Pedreira.
Control Line Class IV-V Jr.-Sr.—1. Sam Beasley 2. Glen Vandiver 3. W. A. Nabor.
Open—1. Robert Lambert 2. J. D. Curry 3. Richard Thickens.
Control Line Class VI Jr.-Sr.—1. Sam Beasley 2. Bobby Krider 3. Glen Vandiver.
Open—1. Richard Thickens 2. John Jelks.

Special Awards

Beauty—1. Forrest Campbell.
Stunt—1. Glen Vandiver 2. Bill Nelson 3. Joe Lee Nelson.
High Point Winner—Joe Pedreira.
Exhibition Scale—William Farnoff.

Michigan

Latest news from the *Torque Twisters Club* of Pontiac is that a recent meeting was held and the following officers elected: Pres. DeVere H. Bigler; Treas. Maxine Howell; Sec. Ethel K. Bigler. The club has expanded to 25 members and boasts that they won 5 first places and 1 second at the Michigan State Meet; they also make a fine showing in most of the meets they attend.

New Jersey

The *Atlantic City Sky Blazers'* U-Control contest in honor of Lt. Merrill Malley, a former national record holder who was killed in the European Theatre of Operations during World War II, was held at Suicide Bowl, Atlantic City, Oct. 26.

* *

On Oct. 5 Commissioner P. F. McGovern of *Jersey Airwheels Aero Club* presented the Eastern Model Airplane Control Line Classic at the Jersey City High School Field.

New York

A U-control speed and stunt contest is scheduled at the Mt. Vernon Flying Fair Oct. 26 at Howard Field, Mt. Vernon, sanctioned by the A.M.A.

* *

ATTENTION: All Model Builders in Queens!! The *Queens Aero Model Association* of 37-18 31st Ave., Long Island City, 3 is reorganizing and is looking for new active members. Officers are: John Lynch, Pres.; John Blohn, Vice-Pres.; Harold Braunlick, Sec.; Raymond Huhn, Treas.; Chick McKevitt and Richard Gajdarik, Publicity Directors. They meet one Tuesday a month and active members meet on Sundays at Creedmore Model Flying Field.

North Carolina

Before we list the results of the 2nd Annual Dixie Championship contest for Free Flight planes, it should be of interest to all modelers that six records were established at this meet on Sept. 18. R. L. Barnhardt Jr., of Concord set a new record with his *Bantam* powered *Zomby* in Class A Open with an average of 19:38. He also set a new record with his longest flight of 57:45. Arthur Deal of Concord sent his *Delong* powered *Powerhouse* aloft in the Class B Senior division to come through with a new record average

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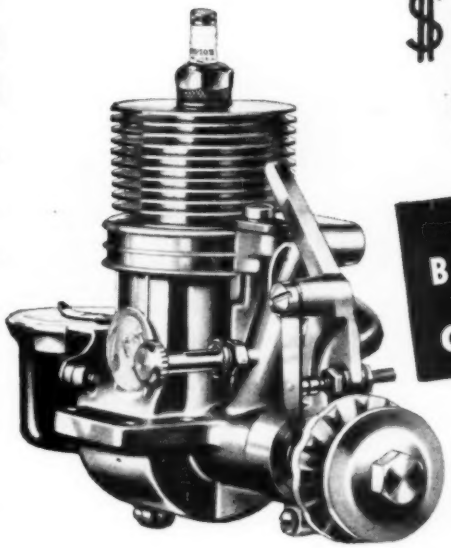

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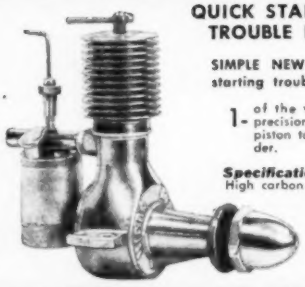

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of 23:34. A. W. Leftwich of Richmond, Va. sent his original design up in Class B Open for a new record average of 19:29. Another new record was his longest flight of the day of 50:10. Clay Jones of Knoxville, Tenn. came through with his *Delong* powered *Powerhouse* in the Class B Senior division for another new record with his longest flight of 45:33. At this point we would like to mention that *The Piedmont Modelaires* of Concord and *The Concord Daily Tribune* sponsored this meet. Charlie Folk, model plane contest director from Hampton, Va. won *Tribune* Perpetual Trophy, scoring highest in this meet. Here is a complete listing of winners of the first three places in all events:

Class A—1. R. L. Barnhardt 2. H. F. Keefe 3. Gene Parsons.
Class B—1. Arthur Deal 2. A. W. Leftwich 3. Clay Jones.
Class C—1. Charles Folk 2. Jimmy Kilgore 3. F. L. Parmenter.
Appearance Event—1. Howard Payne 2. Don T. Howell 3. Chuck Ploertner.

Ohio

A Model Airplane Meet was held at Marion Municipal Airport September 14.

Pennsylvania

The Exchange Club of Bethlehem in cooperation with the *Bethlehem Aero Aces* held a meet at Convair-Air Field Sept. 28.

* *

The Philadelphia Metropolitan Council of the A.M.A. in cooperation with the Philadelphia *Bulletin* is sponsoring a Flying Circus contest on Decoration Day, May 31, 1948.

More than 6,000 spectators witnessed the First annual Gas Model Meet at Wings Field, sponsored by the local Norristown Exchange club with AMA sanction. The national organization is behind model aviation as a hobby and sponsors the flying contest as part of their campaign to combat juvenile delinquency. The prize winners were:

Free Flight—1. Pasquale Ciambrello 2. Norman Van Horn 3. John Dioszegi.
Beauty Contest—1. Alexander Pegon 2. Angelo Campanella 3. Robert Kirschke.
Stunt Jr.—1. Bob McGlade 2. Faye Peoples 3. Clifford Schaible
Stunt Sr.—1. Robert Fryer 2. Don Roetman 3. Bill Malion.
Stunt Open—1. Leon Shulman 2. Walter Patrylo 3. Fran McElwee.
Speed—1. Harry Cosby; 2. Bob Veezey; 3. Le Roy Redman.

Rhode Island

The second annual New England Model Airplane Meet was held at Davidson's Airport in South Attleboro where more than 160 gas and rubber powered model planes vied for prizes valued at $1,000. Winners:

Class A—1. Raymond Brother 2. Barney Hergenrother 3. Paul D'Onofio.

Lou Andrews of Newton, Mass., and assistants start one of the big jobs at East-West Meet

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Class B—1. Joseph Wenckus 2. Douglas Sperry 3. Wilson Johnson.
Class C—1. William Paulson 2. Sydney Kalison 3. George Donohue.
Rubberband—1. George A. Barker Jr. 2. V. A. Abrahamian 3. Ensign Fred Strauss.

The principal record-breaking flight among the U-models was made by Harry Kramer at 117.4 mph. The previous standing record of 115.34 mph was made in April of this year. While this record is still official, it is known that several recent flights have exceeded Kramer's speed but have not yet been published by the AMA.

Another record was broken in Class 5 by Harry Sampson whose plane flew 84.1 mph to beat the standing record of 83.54 mph.

England

The report for the Wolverhampton Model Aeronautical Society contains one successful result. A Junior Member, Eric Thompson, gained the Junior Championship Trophy of the Midland Area Council S.M.A.E. Rally held at Anstey Aerodrome, Coventry on Sept. 14. A team also went to the Worcester Rally and E. Hickman obtained a fourth place. S. Ward, Secretary, will run a Competition and Indoor Group with a view to providing a trained team with high performance models developed purely for contest work. K. Goodchild is working on a jet propulsion unit and T. Dore has had several excellent flights with a rocket propelled glider which has a steady climb under power and a good flat glide. A diesel powered competition model has been designed and flown successfully by H. Dolan (now in R.A.F.) who calls it the *Swoose*.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946

Of MODEL AIRPLANE NEWS published monthly at Mt. Morris, Ill., for October 1, 1947.

State of New York }ss.
County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Jay P. Cleveland, who, having been duly sworn according to law, deposes and says that he is the Publisher of the MODEL AIRPLANE NEWS and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semiweekly or triweekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Jay P. Cleveland, 551 5th Ave., New York; Editor, Howard G. McEntee, 551 5th Ave., New York; Managing editor, Jos. M. Mann, 551 5th Ave., New York.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Air Age, Inc., 551 5th Ave., New York; Jay P. Cleveland, 551 5th Ave., New York; Jos. M. Mann, 551 5th Ave., New York; Jay P. Cleveland and Hyman R. Friedman and Yvonne P. Johnson as Trustees, under the Last Will and Testament of Geo. C. Johnson for Grace E. Johnson and Yvonne P. Johnson, 551 5th Ave., New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JAY P. CLEVELAND, Publisher.

Sworn to and subscribed before me this 2nd day of October, 1947.

AVIS M. HOFFMAN, Notary Public.

[Seal] My commission expires March 30, 1949.

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3. Troy Burris—Class 3 Open U-Line Speed 106.21 mph, National AMA, 5/25/47

Winners at Internationals Detroit—August 13 through 16, 1947

4. W. Trumbull—1st Place Class B—Free Flight—Junior
5. Ray Acord—(New Record—96 minutes) Class B—Free Flight—Open

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Thunderstick

(*Continued from page* 29)

gussets and put them in place. Don't spare the glue at these points because you want to insure future strength.

Next take a piece of medium hard 1/32" sheet balsa and cut out three pieces to fit the three wing panels as illustrated in drawing and plank the leading edge.

EMPENNAGE ASSEMBLY—The stabilizer is constructed in the same manner as followed in the construction of the wing, except that there is no dihedral in it. The ribs are of medium hard 1/16" sheet, the leading edge of hard 1/8" sheet. Planking for the leading edge is of medium hard, straight-grained sheet balsa. One-eighth sheet outline pieces of medium hard sheet balsa are also used in the construction of both rudder and subrudder. A piece of 1/8" square balsa constitutes the rudder spar.

PROPELLER ASSEMBLY—A single-blade propeller is employed on the model, being carved from a medium soft, straight-grained balsa block 1-1/4" x 1-3/4" x 6-1/2". Instructions for blanking out the block are shown on the plan. The blade should have an airfoil and blade shape as shown. In carving the prop, first carve the concave surface of the blade so it is synonomous with the crossectional view of the blade illustrated. Following the same procedure, carve the convex side of the blade. Cut the blade to outline and do any minor trimming.

The following hinge, counterbalance holder, and the reinforcement strip on the front of the hub are now glued into place. Wrap the entire hub with thread to secure these mountings. Coat the hub with glue. Assemble a nose plug using a 1/16" plywood plate for the forward piece, and

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a 1/4" thick pine plug cut to fit integral with the plug hole in the fuselage. Drill a hole through center of plug and insert a 5/16" length of 1/16" I.D. aluminum tubing to keep the thrust line static. Drill out the propeller hub, and assemble the unit by inserting the propeller shaft, bent to illustrated form from 1/16" steel wire.

A spinner may be shaped by lathe or carving from a pine block 1½" x 1½" x 2". Trim the interior out until it fits snugly over the propeller hub. When perfect working order of the stop mechanism is attained, fasten the spinner in position.

COVERING AND ASSEMBLY—Using a sharp razor blade, trim the wing and empennage pieces to an airfoil shape. Then sandpaper the entire model smooth with 2/0 sandpaper. Be sure to remove all glue clots, wood fuzz and unmatched joints to insure a smooth covering job.

Cover the propeller blade with tissue to secure a smooth finish and a strong, stiff blade. Apply several coats of clear dope to the unit and then follow this up with eight coats of red dope. Use pumice or fine well-worn sandpaper between coats to assure a smooth job.

Neatly covering a model is an art that comes only through experience, but a few pointers can be given to help ease your way through the rough spots. The original *Thunderstick* was covered with red AA tissue throughout. In covering the wing, best results will be obtained by covering it in six pieces, the three lower panels first. If trouble is encountered in this procedure, use smaller sections.

The empennage, both stabilizer and rudder, are covered in two pieces each. Always run grain of tissue lengthwise to object covered to secure a neater job.

Four pieces of tissue will suffice in covering the fuselage, excepting the pylon. Trim up the balsa wood portions such as sub-rudder and wing mount by covering them with tissue, using dope as an adhesive. After the plane is covered water-dope the tissue to tighten it up. When dry, apply three coats of clear dope as a finisher. Sand the surface lightly between coats with well-worn sandpaper.

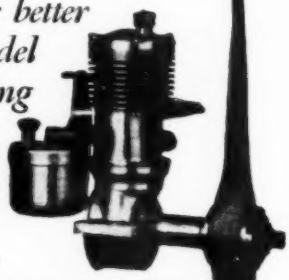
Assemble the model by trimming away the portion of the fuselage illustrated in the plan to fit the stabilizer. Slide the stabilizer into position and apply adhesive. Then attach the rudder and sub-rudder and the assembly is completed.

Make up a rubber motor of ten strands 1/4" flat brown rubber 22" in length and lubricate it thoroughly. Place a piece of rubber tubing over the prop shaft and install the rear motor mount, consisting of a length of 1/8" birch dowel. Next, attach the counterbalance.

ADJUSTMENT & FLYING—*Thunderstick* is relatively easy to fly; the original showed no signs of instability. For the first flights pick a field free from obstructions, with grass ankle or knee height so as not to damage the ship in case of maladjustment. Pick a nice calm day, preferably late afternoon or evening, for your trial flights. Line up the model to see if it is warp-free before attempting any flights. Then try a few hand glides. When the plane appears to glide correctly, try a power-flight of about fifty hand winds. After trying several of these, the power output may be increased providing everything is functioning smoothly. The original would climb to the right in large circles and glide to the right in those small, thermal-seeking circles.

If her attitudes in flight are satisfactory take a winder, stretch out your motor and pack in the turns. Turn her loose and start heading down the field—but fast!

For better model flying



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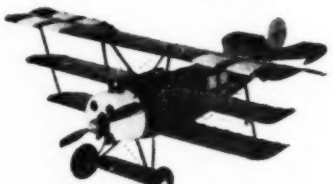

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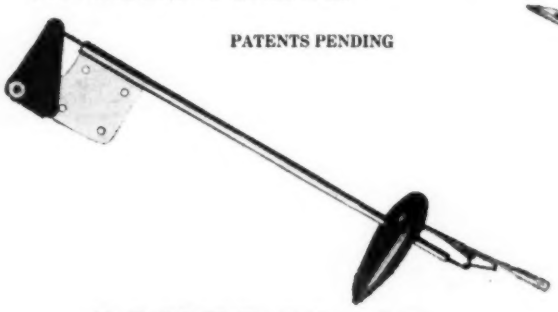

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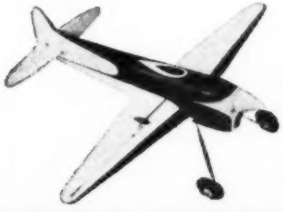

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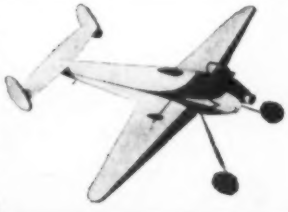

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(SEE PAGE 75)

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Newsletter

(*Continued from page 34*)

its place; precision has, too. What we like to see, and originally commented upon, is the great interest being shown in stunt flying. We consider it a healthy trend. In our own small way we're doing all we can to see new stunt-precision-scale-stability rules created to give Mr. Average Modeler a chance with his standard ship powered by a standard motor.

We see absolutely nothing wrong with pure speed flying, but we have observed that vast numbers of "Sunday" flyers feel they have no place or chance to win in a straight speed meet. At least in free flight events the opportunity of hooking a thermal is more or less common property. But in control line flying it is the "souped up" motor, the professional-finish job, and the expensive equipment—plus good design and flying ability—that determines the winners.

Believe us, Mr. Bucholz, we have no dislike for speed flying. We'd like to see more and faster times posted at all the meets. On the other hand, we are mighty happy to see events coming to the fore in which a greater number of modelers will be encouraged to participate. We speak not for the A.M.A. but solely for ourself.

* *

From down Texas way, C. J. McDonald, speaking for the "Gluebirds" of San Antonio, comments on the professionalism angle. He says:

"Though this letter may be a little late it will express the ideas of our club in respect to professionalism in the model fraternity. The average modeler spends $30 to $50, and many precious hours building a model. With a first place prize of not more than $5 and/or a trophy, he is going to be hesitant about flying and risking the loss or crackup of his plane. Further, trophies in the modeling field have become such a common thing that they have lost the honor they used to hold in winning one. They have been properly nicknamed (hereabouts) 'Dust Collectors'.

"Looking at the other side of the picture let us suppose that the better model builder wins several contests during a year's time and wins $25 or $30—even more—at each. The $200 or $300 he wins will not in the least be sufficient for him to quit work and live on. Especially considering the fact that the average builder spends this much during the year for models and motors.

"Unless a modeler can live on what he wins he should not be classed as a 'pro'—and surely there are none. A person employed and paid for using his designs or skill, thus making his living at same, should be classed a 'pro.' Contests won by the pros are quite a few, and besides the pro who is a real gentleman will turn over his winnings to the next in line who is a non-professional, as has happened in the past at several contests.

"The feeling of the more advanced members of our club is that they are fully capable of competition against the pro and relish the thought of flying against him and attempting to out-fly him. It might be added that they often do. With the introduction of a professional and amateur class, we are afraid that many model builders will quit and that many modelers-to-be will never start.

"We are strongly opposed to professionalism, unnecessary trophies, and small first place prizes."

We must agree with Mr. McDonald that practically no contestant in the U.S. could live off his winnings, let alone pay his expenses travelling around from meet to meet. Therefore, there can be no "professional" class in the sense that there is in tennis or golf. As for those who work in the industry in a full-time capacity, that is another story, it is quite possible that a few far-sighted souls will set a good example for their "commercial" brethren by not grabbing off all the good awards at small meets to the dismay of non-expert flyers not employed in the industry.

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city contests where the gripes have been registered when the industryite walked off with all the hardware or cash. No one we know of has yet suggested that in the bigger meets where many a hobby shop employee, owner, manufacturer or paid designer compete against one another as well as against Joe-the-Unprofessional, a line of demarcation be established between the Simon-pure amateur and the industry flyer.

A little common sense liberally applied in the smaller meets by the industry entrant should do the trick—maybe there are times when such individuals should *help* instead of *fly*. Unwise is the manufacturer, designer or hobby shop owner who builds up illwill by competing against his customers in smaller meets unless such competition is welcomed.

* *

On the subject of competition, the past season certainly has seen plenty. As this is being written two notices arrive listing meets scheduled for the same Sunday in towns less than 10 miles apart. Both contests are bound to suffer. The '47 season produced more meets with less coordination than any in our memory. There were a number of good meets, but an even greater number of poorly run competitions.

It's a crying shame that for all the hard honest work that goes into most meets, so many should go astray on a few minor points which pull down the general level of the competition. Obviously, what is needed is better coordination between clubs in the same metropolitan area, between clubs in the same state. Regional differences and conflicts in flying dates should be ironed out by creation of regional councils—like the fine working Mid-States Model Aeronautical Association in the mid-west.

Even the National meet was guilty this year of too great reliance on volunteer personnel unskilled in timing or recording. A great many man-hours of preparation went for naught when enthusiastic but untrained timers were utilized.

The greatest fault with the entire model aviation picture right now—the activity as well as the industry—is that all emphasis is on "expertism." No one seems interested in helping the younger and newer recruits. Most clubs look down on rubber flying; many hobby shop operators turn up their noses at the possible sale of inexpensive beginner's kits; all the emphasis is on the expert who can very well look after himself.

For that reason we were somewhat disappointed in the initial programs of the Institute of Air Age Activities and the American Legion, when both started out with the big "for-experts-only" meets. Maybe these organizations will work down to the little fellow one of these days. We sure hope so. As things stand now, nobody much is helping the "expert of tomorrow."

Any and all worthwhile ideas on how beginners can be encouraged, new model flyers brought into the picture, and bigger and more active clubs set up for the non-experts will be much appreciated and will be given considerable publicity here.

* *

So, Mr. Bucholz and Mr. McDonald, and all club leaders, contest directors and activity boosters everywhere, let's put on our thinking caps and see what we can develop in the way of *beginner* interest. Let's encourage new modelers, and when we have 10 new novice flyers for each expert active today, then can we settle down again to discuss professionals vs. amateurs, speed flyers vs. stunt champs.

As for us, we're going to concentrate on ways and means of getting more folks active in model aviation. Are you with us?

Then, how about some ideas on the subject?

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"JAY" SIMMONS MODEL SPECIALTIES

West Coast Tips

(*Continued from page 33*)

Everything is under control at all times, and the meet really moves along.

Our good friends from El Paso — Don Hogan, Don Guthrie, Bob Parker, Smiley Evans, Horace Sowell, Ed Salguero, Herman Young, H. H. Shryock and Charley Bowman, all members of the *El Paso Miniature Motors Club*, are back in town. There is an old saying that Texans sure do get around. This group is the living personification of that statement. In the last four months, they traveled something like 2500 miles in a bus they chartered for attending model meets. Their itinerary: Belen, Las Cruces, Carlsbad, Albuquerque, N.M.; Odessa, Tex.; and Tucson, Ariz.

The members pay their own way, and the club treasury absorbs any extras. (Incidentally, this club has a nice sum in the treasury, due mostly to the promotion efforts of the club, which have been crowned with success. Remember International Aviation Day? Well, these boys really threw a shindig at El Paso on that day. This year's meet will be held Dec. 6-7.

Don Hogan tells us that through the activity of their group there are now model clubs in Chihuahua City and Mexico City, Old Mexico. That is a definitely worthwhile undertaking, and we are heartily in favor of it. It might be a lesson to the modelers in San Diego to extend their good wishes southward also.

Incidentally, here's a little squib on Donal Hogan. He is the guiding light of the *El Paso Club*, being president, and owning a model shop (Donal's Model Supplies); the boys just naturally have a place to meet, right in the shop. Don is also one of the topnotch stunt artists of the club, as well as a very good team stunt man. Now this is enough qualifications to get anyone mentioned in this column, but we have one more item to report: Don does all of this activity from a wheel chair! Now we think this is admirable from the standpoint of sheer guts, but also look at the inspiration a guy like Don gives to the bedridden and tied-down kids all over the country. We think he is great!

Don't forget International Aviation Day —El Paso, Tex. Celebrations begin Dec. 4 and continue until Dec. 7. Model contest Dec. 6-7.

* *

We have another contest to mention which will be held in Ontario by the *Valley Model Sky Hawks* on Nov. 30. There will be three breakdowns in age groups: Junior, Senior, and Open, with the Open class further broken down into expert and amateur classes. There will be 16 first-place trophies and corresponding awards for 2nd and 3rd.

Sponsor is the Ontario Y Men's Club. Events will be A.B.C. Speed, Precision, Scale, and Team Stunt. The contest is open to all, and Ontario hospitality will prevail.

On that score, we would like to mention that Ontario is the site of the Valley Miniature Racing Car Assoc., and the operating headquarters for such race car big shots as Dick McCoy, Wilmer White, Charley Lamb, Clarence Benskin, Hoppy Hopkins and many others. Woody Woodward, Contest Director, is himself a well known racing man, and these boys really go out of their way to make you feel "to home," so plan on having a good time.

* *

LAST MINUTE FLASH!

Just under the deadline, we give you the results of the Sept. 21 *Anaheim Balsa Butchers* meet. Keith Storey became "Mr. Big" out West when he won both Class C and Class B speed events and tied for first in Class A speed with Ed Sharp who teamed with Don Newberger. This is one of the first times we have ever seen a tie with hundredth second watches, but there it was to prove the exception. Ed Sharp took the trophy on the flip of a coin.

In the precision event, Ed Landsberg demonstrated real skill to nose out Don Gulotta and J. C. Yates. Bob Palmer's gorgeous Lockheed *Altair* took the scale event over a bevy of beautiful ships.

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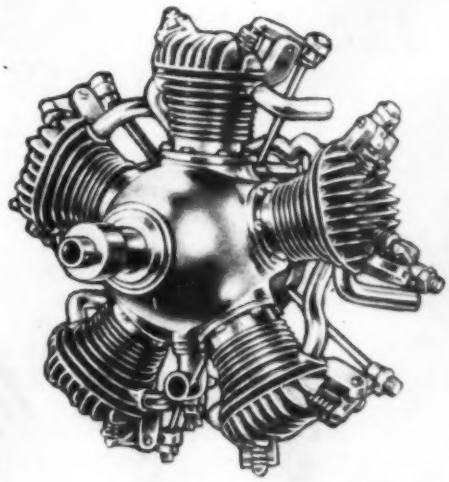

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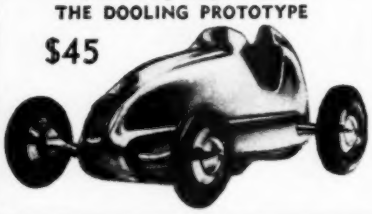

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Diesels Grow Up

(*Continued from page* 32)

engine. One is the same as in our fixed motors, but the other is entirely different. The latter piston is in the top of the cylinder and faces the working piston. This so called contra-piston is raised and lowered by a screw device, thus raising and lowering the compression ratio of the motor. The main argument in favor of this arrangement is that the engine can run on a more diversified diet of fuels; also, we must admit the novice will find variable compression engines easier to start.

For our own purposes, we find the variable and fixed compression ratio diesels about equal in starting, since once we've learned how, even the most stubborn of the diesels starts easily. The great range of fuels used in the various diesels left us rather confused, what with our large stable of engines, until we discovered a simple trick. We found that all our engines will run on the same fuel, a three parts ether one part oil blend. While this may not be the case with your individual motors, a mixture can be found with a little experimenting which will run any and all diesels you may have. The ability to run the *Mite* on a fuel intended for the *Drone*, or the *Movo* on this same fuel, was something we had to prove (even to engine mfrs.)—but it can be done.

Let's look at each diesel by itself.

MOVO D2→This is an imported diesel and the first to appear in any quantity in the U.S. It has a displacement of .200, if our metric system conversions are to be trusted. We found a 10" dia. 6" pitch prop to be best for general use, and feel the *Movo* is best suited for free flight work, or for small sport flying U-Control models. A *Movo* was tried in a model speed boat and gave some surprisingly good results. The *Movo* seems easiest to start at its maximum compression ratio; this adjustment also affords the most power.

MITE—is a Brooklyn born engine, designed by Howard Manderville and developed by Walter Schroeder and Bill Seidler. For some time it held the AMA speed record for class I U-Control speed. Its .099 displacement places it at the bottom of our size category, but it puts out an amazing amount of power. An 8" dia. prop with an 8" pitch appear to be best suited for U-Control work. It is interesting to note that the *Mite* has the shortest stroke for its bore of any diesel, which accounts for its higher speeds. We tried this fixed compression job in various models including a two channel radio control model, with excellent results.

DeLONG—We tried this out at the De Long factory in Cleveland, before it had reached the market. It's a variable compression ratio engine, with a .299 displacement. We found it easy starting, and it seemed to put out considerable power. We saw it test flown in a Bipe stunt ship, and the results were very satisfactory. It's designed by Mr. DeLong of Super Motors, who also developed the *DeLong 30* gasoline engine.

C.I.E.—Barney Snyder of the Compression Ignition Engines division of Modelcraft sent us a *C.I.E.* which was tested in a U-Control model. This engine is a variable compression ratio job with a displacement of .144. It swings a 9-6 prop quite adequately and starts well. We got better results with a heavier grade of oil than recommended and found that the engine started easiest with a very low compression ratio, and tuned in nicely to peak power when the compression ratio control was advanced.

EDCO—We were unable to make any

actual tests on the *Edco* but are told that it can swing a 12-10 prop with ease and at reasonably high speeds. The engine has the shortest stroke to bore ratio of any engine, other than the *Mite*. The *Edco* factory ran tests for us which showed that the engine performed nicely on our recommended three to one fuel.

DRONE—We have been flying with the *Drone* for several months now and find its .297 displacement gives adequate power to handle ships which would be considered as excessively heavy for an equal displacement gasoline engine. We have had particular fun with *Drone*-powered P-39 scale models. The *Drone* can take these plastic prefabricated ships along at a lively 60 mph and has adequate power for stunts and emergencies. Leon Shulman's peppy little diesel runs equally well with a 10-12 or an 11-10 prop.

H & H—This is a glow plug engine; it contains a tiny coil in its cylinder head. This coil is heated by an external battery for starting, but once the engine is started the battery may be disconnected and the engine continues to run since the firing of its fuel serves to keep the coil hot. It is not a true diesel but is probably as much a diesel as are our compression ignition engines, so it is mentioned here. The manufacturer recommends use of a starter with this engine as "it is difficult to flip the propeller fast enough, and use of a starter saves on batteries."

DIESELIZED GASOLINE ENGINES—There are several "super" hot fuels which make it possible to operate most conventional gasoline engines as diesels. The use of Liquid Dynamite, and of TNT, the two fuels mentioned, makes it possible to take advantage of the weight saving feature of diesel engines with a gasoline engine.

When these fuels are used the sparkplug electrodes are allowed to become hot while the engine is started as a regular gasoline engine. Once the plug electrodes become hot, the ignition is disconnected and the motor continues to run, since the hot electrodes fire the fuel. Thus we see that our gasoline engines are converted, by merely changing the fuel, into glow plug diesels.

It should be noted that all engines will not operate on these fuels. Only those gasoline engines with very good piston fits are successful with this system. However, the compression ratio need not be excessively high, although for top speed this ratio is usually raised above normal. Special propeller recommendations have been made by the manufacturer of these fuels, and when the fuel is purchased be sure to get a copy of the fuel maker's instruction sheet.

If possible, it is recommended that you increase the compression of your motor by lowering the head when planning to use this method of operation. Another valuable hint is the reduction in size of sparkplug electrodes. If you file down as much of the electrodes as possible they will become hot more readily and stay hotter, thus assuring better "dieseling."

For those of you who are just becoming acquainted with the diesel motor we recommend that you read our last article in conjunction with this one. Next time you go out flying with that new diesel job, don't worry if you forget to take your booster batteries—you won't need them anyway!

* * *

EDITOR'S NOTE: As fully explained in the June 1947 issue by Mr. Bayha, the term "diesel" as applied to these engines is a misnomer. They are actually compression ignition engines, but the name "diesel" is so widely used in the model field and is so much handier than "compression ignition engine" that it has been used throughout this article.

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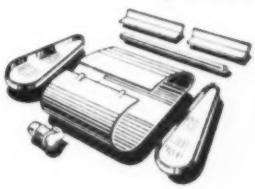

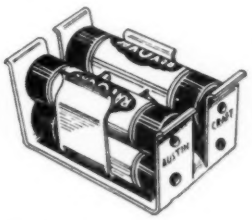

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Sub-Midget CO-2

(Continued from page 21)

point. Note that the grain of this piece runs fore and aft.

Now cement one side in place. The sides are of 1/16" soft stock with the grain running up and down. Since you probably won't have a sheet wide enough for a whole side it may be put on in pieces. Fasten the two uprights also of 1/16" thick sheet, then attach the other side.

The motor makers recommend use of the metal eraser holder on a lead pencil to cut the tank hole and this was found quite satisfactory; a 1/4" round file was used to trim the hole for a snug fit. The motor and tank may be permanently glued in place but we never glued ours and it hasn't worked loose, even after dozens of flights. The tank is held at its forward end between the two 1/16" thick uprights that were inserted before the sides were glued in place. Notches for the feed pipe and the charging nipple prevent the power unit from twisting.

The fuselage nose is tapered to a round shape and the edges rounded off smoothly. If desired, a cockpit with tiny celluloid windshield and a streamlined headrest may be added. The last step is to cut out the bottom of the fuselage aft of the cockpit so that the wing can be installed.

WING—This is made of soft 1/16" balsa. Cut to the proper outline, then taper the rear edge on the top and round off the nose. It is best to make the wing in one piece, curve it to airfoil shape, then cut it at the center and glue together with the proper dihedral.

Only two ribs are used, made of 1/8" thick fairly hard sheet. Cut the top to the airfoil shape shown, leaving them about 1/4" high at the deepest point. Dampen the top of the entire wing—don't soak, just moisten your finger in water and rub over the surface. Allow the water to soak in for five minutes, then bend the wing to the approximate airfoil shape, making the undercamber a bit deeper than required. When the water has practically dried out, cement the two ribs in place.

After the wing is thoroughly dry cut it in two at the center, sand the edges so they will meet squarely, and reglue with the tips raised to specified dihedral height.

The completed wing is now fastened in the cutout of the fuselage; trim the section of fuselage you removed so it will fit snugly, and glue in place.

TAIL AND BOOMS—The two tail booms of 1/8" thick rather soft balsa are now cut and the landing gear wires bound and glued to the forward end. The undersides of the two ribs are trimmed so that the booms fit against them vertically and in line with the centerline of the fuselage.

Assembly of fuselage, wing and booms should be such that the lower front edge of the wing is 3/32" higher than the trailing edge, when the fuselage and booms are horizontal. Check this carefully to make sure the wing is at the proper angle of incidence.

The tail surfaces are all of 1/16" soft balsa sanded smooth, with leading edges rounded and trailing edges tapered to a blunt knife edge.

The tail skid is simply cemented to the underside of the stab. Wheels of celluloid were used on the prototype and strips of bond paper 1/4" wide were glued to the landing gear wires to take away the spidery look.

FINISHING—When the model is completely assembled, go over it with fine sandpaper, then apply a thin coat of one-half dope—one-half thinner. When dry, sand again with very fine paper. This treatment adds a bit of weight but seems to pay off in a smoother surface and thus higher efficiency. A few details, such as aileron markings and wing and tail stripes, were added by using colored tissue doped on.

Since the wing is made of soft stock it is wise to dope a strip of tissue over the leading edge—if you don't do this, twigs, branches and even large weeds will leave their mark following collisions.

The propeller is cut from medium hard wood (not balsa, as a reasonable amount of flywheel effect is desirable) from the block specified. Sand well and give it several coats of dope. Balance the prop carefully on a short piece of wire supported on razor blade edges, then fasten it in place. A hollow headed bolt of proper size makes a handy wrench for the tiny prop nut.

FLYING—Due to the sweepback of the wing leading edge, the model should balance at approximately the center of the wing, at its widest point. It is quite likely that weight in the form of solder or lead shot will be needed; this should be inserted in a hole at the nose of the fuselage until the proper balance is attained.

It was found desirable to use a small amount of downthrust; the approximate thrust line is shown on the drawing and is attained by slanting the entire motor and tank, with the tank nose lowest.

It will be necessary to warp the wing in order to counteract the torque. On the model shown, a right hand prop was used and was simply reversed to work as a pusher, so it now turns clockwise as viewed from the rear. (The motor runs equally well in either direction.) Therefore, the left wingtip (as viewed from the rear) was warped down a bit. Also, it is desirable to give a bit of right rudder—that is, bend the rear edge of one rudder about 1/16" to the right as viewed from the rear. The correct adjustment is obtained when the ship circles rather steeply in the direction produced by torque, when under power, and circles in the opposite direction when gliding.

The first step before flying is started—and after the model has been balanced with nose weight as noted previously—is to try a glide or two over long grass. Make adjustments with the stabilizer trailing edge so that the glide is as flat as possible, but with no trace of stalling.

You are now ready for power flights; charge up the tank and get set for a good chase. If the model glides smoothly but stalls under power, increase the downthrust. Needless to say, a model of this size and weight should be flown in calm weather only, although when correctly adjusted it will be surprisingly stable even in windy conditions.

Now a few words on results: the first few flights made with the prototype were spectacular but short! The tiny engine has plenty of power, and until we had worked out the proper combination of wing warp, rudder offset and downthrust, the "flights" consisted of loops, rolls, stalls and whistling vertical dives. These troubles were soon cured, however, and then we began having more fun with the little pusher than we ever had with *any* model, bar none!

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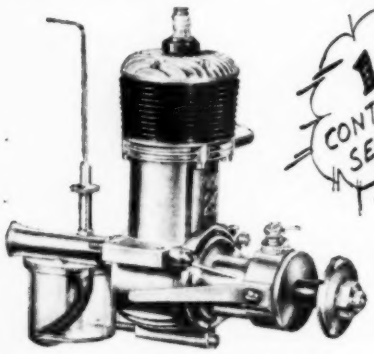

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Plane on the Cover

(*Continued from page* 19)

siderable "beefing up" of the fuselage to take belly landings, and the fuselage structure would be heavier due to suspension of it from the wing rather than its riding along atop the wing. Careful analysis revealed that the low wing configuration could be built with a weight saving of 720 lbs. over the high wing design.

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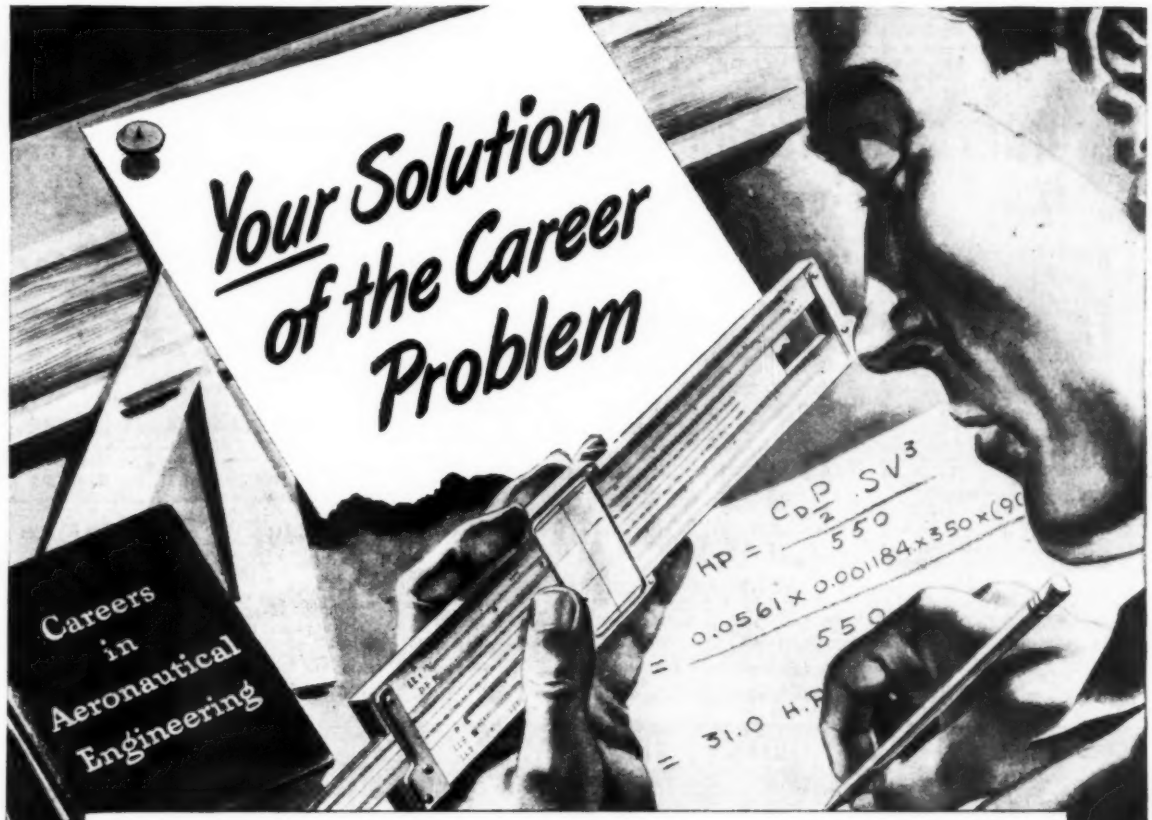

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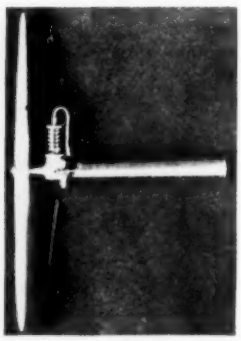

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The 2-0-2 cockpit was designed on the basis of the airline survey. Windshield panels are extra large and bird-proof, heated for de-icing and contain defogging and defrosting equipment. The pilots' seats were especially developed for both comfort and convenience. To relieve the flight crew of as many duties as possible, the cabin temperature and air conditioning and the cowl flap controls are entirely automatic in operation. The flap controls can be pre-set and the flaps move to the desired position and stop. A master radio control panel is located between pilot and co-pilot, and all switches and knobs are in an orderly arrangement in refreshing contrast to the maze of buttons, toggles and dials on older types.

A special integral loading ramp is carried within and operated by the stewardess. This saves time in that the passengers do not have to wait for an exterior ramp to be rolled out and set up before leaving the airplane. These ramps may be located both at front and rear of the cabin, permitting passengers to file out the rear while new passengers enter from the front.

Particular attention was paid to maintenance during the survey, and airline mechanics can always be counted on to provide a manufacturer with an "earful" of well chosen comments regarding the accessibility of various equipment. In the 2-0-2 all electrical, hydraulic and radio accessory equipment is mounted in three bomb-bay type compartments in the belly. A mechanic opens a small door covering each compartment and everything therein is easily accessible from the ground. A hinged door drops down from the engine nacelle and a step inside permits the mechanic to use the door as a working platform. A small light inside makes it unnecessary for the mechanic to haul a light and cord around while he works. The firewall has a removable panel enabling the mechanic to work on the accessory section of the engine from the wheel well. The pilot's instrument panel may be reached from the front through a removable door in the nose wheel well and the entire panel may be passed through is necessary.

The cabin is 34 ft. long and 9 ft. wide. The standard version carries 36 seats, 18 on each side of a center aisle. A circular lounge can be added to the rear of the cabin with 4 additional seats, making a total capacity of 40 passengers. Special Warren McArthur seats are used and the author and others who have sat in them can testify to their luxurious and roomy comfort.

The 2-0-2 is powered by two Pratt & Whitney R-2800 *Double Wasp* engines rated at 2100 hp each. With water injection equipment these engines will develop 2400 hp for takeoff, rapid climb or higher cruising power. The powerplant systems are identical and may be interchanged left or right. The propellers are Hamilton Standard full reversible, square-tipped designs of 13 ft. 1 in. diameter. These propellers are equipped with an electrical heating system to prevent ice formation.

An important new feature of the 2-0-2 is the van Zelm aileron, which was designed to overcome the reverse yawing effect of conventional ailerons in which the leading edge extends below the wing when the aileron is in the "up" position. To overcome the turbulence created by this condition, the van Zelm design incorporates a small auxiliary airfoil located

GMCO NOTES

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3/32 x 1/4	3.5c
3/32 x 3/8	2c
3/32x1/2	2 1/2c
1/8 x 1/8	5c
1/8 x 3/16	3.5c
1/8 x 1/4	2.5c
1/8 x 3/8	3c
1/8 x 1/2	4c
1/8 x 3/4	5c
1/8 x 1	6c
3/16x3/16	4c
3/16 x 1/4	4c
3/16 x 3/8	5c
3/16 x 1/2	6c
3/16 x 3/4	8c
3/16 x 1	9c
1/4 x 1/4	9c
1/4 x 3/8	5c
1/4 x 1/2	7c
1/4 x 3/4	10c
1/4 x 1	12c
5/16 x 5/16	5c
5/16 x 3/8	6c
5/16 x 1/2	8c
5/16 x 5/8	9c
5/16 x 1	12c
3/8 x 3/8	5c
3/8 x 1/2	10c
3/8 x 3/4	12c
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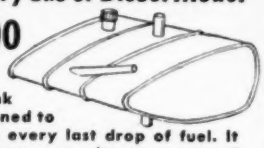

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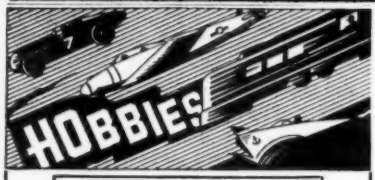

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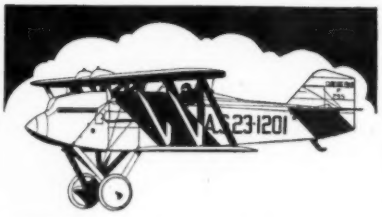

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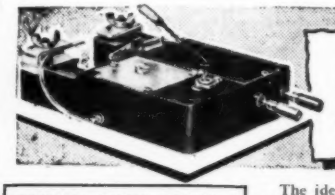

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forward and below the leading edge. A seal closes the gap between the aileron and the wing trailing edge. The airfoil thus smoothes out the air beneath the aileron when in the "up" position.

Several versions of the basic 2-0-2 will soon be available. The cargo 2-0-2 has a 47 ft. cargo compartment with total volume of 2240 cu. ft. The main cargo door, 8 ft. by 6 ft., and a forward door, 3 ft. by 5 ft., permit easy loading of bulky items. Martin Honeycomb structural flooring in the cabin saves weight and, being waterproof, permits flowers or perishable foods to be sprayed during flight. Internal combustion heaters, a spraying system and a refrigeration unit permit any type of cargo to be carried without danger of spoiling. The Martin 3-0-3 is a pressure cabin version with smaller wing and higher speed. A "military" version of the 2-0-2 has been announced, leading to speculation concerning an impending AAF contract.

The 2-0-2 has a span of 92 ft. 9 in., length of 71 ft. 4 in., and height of 28 ft. 6 in. It weighs 22,916 lbs. empty and 38,000 lbs. fully loaded. It has a top speed of 296 mph at 7300 ft. and cruises at 263 mph at 10,000 ft. It has a maximum range of 1165 miles and normal range of about 500 miles. It has an initial rate-of-climb at sea level of 1425 ft. per minute, and a service ceiling of 29,000 ft.

The production model 2-0-2 is actually the only model, for the prototype was simply the first production model off the line. Following completion of the 2-0-2 design, the Civil Aeronautics Board issued new government specifications but it was too late to make changes in the airplane since CAB certification tests were already underway. However, the CAB was adamant and, as a result, several major changes were made to meet the new, more rigid CAB requirements. These changes included the addition of dihedral to the wings and a large dorsal fin, both of which provided the airliner with added lateral and directional stability. These changes, although noticeably altering the external appearance of the plane, actually created only a short delay in its delivery.

The new accelerated service test of the CAB became effective during the tests of the 2-0-2 and it became the first airplane to undergo this rigorous test. These are designed to "shake down" the airplane by subjecting it to almost continuous flying under actual airline service conditions. The 2-0-2 visited 34 different cities and covered 17,000 miles in 63 hours flying time compressed into 8 days.

It came through this grind with flying colors and is now the proud possessor of CAA Type Certificate No. 795, which authorizes all airplanes of its type to bear an "NC" license and to engage in scheduled airline operation. First airline to receive the 2-0-2 is Northwest Airlines, which will have them in operation by the time you read this. The first 10 planes will go to Northwest, with the second group scheduled for delivery to Linea Aerea Nacional, Chilean airline. Delivery of the transports are in the exact order in which contracts were completed.

As the first postwar airliner, the eyes of the aviation world are on the Martin 2-0-2, for in replacing the Douglas DC-3 the new liner has taken a mighty big shoe to fill. But airline mechanics, Martin engineers and just plain spectators are agreed that the Martin 2-0-2 has the lines, the technical features and the money-making qualities of a "workhorse of the air" and only the grueling test of a decade of airline service will prove its greatness.

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Cleveland Air Races

(*Continued from page 13*)

ticipation. Lt. Col. Robert L. Petit led the field of six P-80s at an average speed of 500.704 mph, taking the trophy home to his photo reconnaissance group at March Field. This race consisted of seven laps over a 22-1/2 mile course. Gravity meters carried in the participating planes showed results of from 7 to 12 Gs registered at the turns!

In contrast to the dangerous high powered events, and possibly pointing the direction to the ultimate solution of the problems encountered, was the Goodyear Trophy Race. In this event we saw more originality expressed in each individual entry than in all the big jobs put together. Here was a race that brought back memories of the small pylon polishers of bygone days. And here were the airplanes to thrill the soul of anyone with an eye to building models.

There's little wonder that the Goodyear should stir up thoughts of yesterday's topnotchers; it was the brain child of Art Chester, Benny Howard, Tony LeVier and many other veterans of the Professional Race Pilots' Assoc. At the close of the 1946 races these individuals got their heads together and decided to do something to put air racing on a safer basis, increase its spectator appeal, keep its cost down and stimulate the originality of America's backyard mechanics. The outcome of their deliberations was the set of limitations which are the basis of the Goodyear Trophy Race.

William Brennand, 22 year old protege of Steve Wittman, stepped into the old maestro's shoes to take home the trophy and $8500. His little red *Wittman Special* bore a striking resemblance to Steve's old *Oshkosh Chief*. It had that same "flying barn door" design which has characterized Wittman racers since their inception some 16 years ago. The square tipped, wire braced mid-wing, and box car fuselage left little doubt as to who its designer was. Yet nothing on the field could touch its speed. It was interesting to note how many of the new racers have followed the Wittman trend. His single leaf spring steel landing gear was apparent on several of the ships. In fact, this particular innovation of his is now used commercially on the light Cessna airplanes.

In all, 19 planes successfully qualified for the Goodyear Race. How many more were built but never reached Cleveland we cannot know. But every one that did appear showed original features and fine workmanship. All used the Continental C-85 engine. Generally speaking, four types of construction were featured. The first and most predominant was Wittman's style, as previously mentioned. These ships were of the conventional steel tubing type fuselage with wood stringers and fabric covering, and having a wood and metal frame wing with fabric covering and external wire bracing. Their wings were rectangular in planform with a rather low aspect ratio. This type came closest to the minimum weight and thus had the advantage of low power loading. External bracing of the wing also allows use of an extremely thin airfoil, which in turn permits greater wing area, a distinct advantage for making tight pylon turns.

Paul Penrose's second place winner was another of the same general type. However, this beautiful little job, designed by Art Chester, featured a butterfly tail of the type seen on the Beechcraft *Bonanza*.

A second type of construction was characterized by Tony LeVier's two *Cosmic Winds*, flown by himself and H. R. Salm-

on. The most distinctive appearing airplanes in the meet, they were designed by a group of Lockheed engineers. Identical in appearance and construction, they were all metal with full cantilever tapered wings. However, this type of construction resulted in a weight of approximately 800 lbs. per ship and consequently, a little less oomph.

The *Nimmo Special* flown by Mike Argander was a perfect example of the clean design offered by full cantilever construction with fabric covering. Although somewhat lighter than the metal skin jobs, there was again something lacking in mph. Dwight Dempster's *Allenbaugh Special* was also full cantilever, resembling the *Cosmic Winds.* But in this case a fourth type of construction was featured: that of molded plywood. Here again that demon weight took its toll of speed.

For all the newness of this race, there was yet something old. W. F. Falck brought back Art Chester's old *Jeep,* somewhat rebuilt and trimmed down from its former 375 cu. in. class. The modified Brown, flown by W. F. Robinson, was none other than the famous B-2 which at one time was tops in the 600 cu. in. class.

The total racing program was rounded out by a 500 mile cross-country jet event, a race for P-51s only, a race for P-38s, one for P-63s, and a women's event exclusively for AT-6 planes. Each of these races merits a fuller description, but it will suffice to say that each contributed to making the 1947 National Air Races the greatest aerial show ever staged.

OFFICIAL AIR RACE RESULTS

Thompson Trophy Race		
		MPH
1. Cook Cleland	Corsair	396.1
2. Richard Becker	Corsair	390.1
3. Jay Demming	P-39	389.8
4. Steve Beville	P-51	360.8
5. A. W. LeVier	P-38	357.4
6. William Bour	P-63	327.2
Thompson Trophy Race—Jet Division		
1. Lt. Col. R. L. Petit		500.7
2. Lt. J. R. Howard		497.8
3. Lt. Col. W. Dunham		494.6
4. Capt. W. M. Gates		484.8
5. Lt. Col. B. Preston Jr.		443.1
6. Capt. L. W. Powers		430.2
Goodyear Trophy Race Finals		
1. William Brennand		165.8
2. Paul Penrose		165.3
3. H. R. Salmon		158.7
4. Tony LeVier		157.8
5. Warren Siem		151.2
6. B. F. Robinson		143.8
Sohio Trophy Race for P-38's		
1. A. W. LeVier		360.8
2. Charles Walling		351.7
3. Ivis H. Hill		347.3
4. John E. Thompson		328.7
5. Sonny Hlavacek		270.1
Halle Trophy Race for AT-6's		
1. Ruth Johnson		223.2
2. Grace Harris		215.0
3. Edna G. Whyte		210.7
4. Jane Page		209.3
5. Anna Logan		186.8
Kendall Trophy Race for P-51's		
1. Steve Beville		384.6
2. Kendall Everson		377.9
3. Woody Edmondson		372.3
4. M. W. Fairbrother		367.0
5. William Murray		357.0
Tinnerman Trophy Race for P-63's		
1. Ken Knight		352.1
2. Charles Tucker		347.6
3. Steve Wittman		339.6
4. A. T. Whiteside		313.5
5. William Bour		254.9
Allison Trophy Race for Jet Planes		
1. Capt. Richard H. Burnor		
2. Capt. Edward Bishop		

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3/32 ....4 for 10c | 3/8 ....6c ea.
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1/16x3/16 12, 5c | 3/16x3/4* 2 1/2c
1/16x1/4....10, 5c | 3/16x1* ....3c ea.
1/16x3/8......8, 5c | 1/4x1/4* 4, 5c
1/16x1/2......6, 5c | 1/4x3/8* 3, 5c
3/32 sq......12, 5c | 1/4x1/2*..........2, 5c
3/32x3/16 10, 5c | 1/4x5/8..........2, 5c
3/32x1/4.... 6, 5c | 1/4x3/4* .....3c ea.
3/32x3/8.... 5, 5c | 1/4x1* ....4c ea.
3/32x1/2.... 4, 5c | 5/16 sq.*.....2, 5c
1/8x1/8*.... 12, 5c | 3/8x3/8* .... 3c ea.
1/8x3/16* 10, 5c | 3/8x1/2 ....4c ea.
1/8x1/4*.........6, 5c | 3/8x3/4* .....5c ea.
1/8x3/8*...... 5, 5c | 1/2x1/2* .... 5c ea.
1/8x1/2*.........4, 5c | 1/2x3/4* .....6c ea.
1/8x1*...........2, 5c | 1/2x1* .... 7c ea.
5/32 sq.*....3, 5c | 5/8x5/8* ....7c ea.
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3/16x1/4*....4, 5c | 3/4x1* ...... 9c ea.

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1x3x3 4c | 3x3x6 19c
1x3x6 7c | 3x6x6 40c
2x2x2 3c | 4x4x4 27c
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2x3x3 7c | 4x6x6 60c

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1x1 1/2x12 7c
1x1 1/2x15 8c
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11" x | 45c 50c
12" 10c | 45c 50c
13" x | 45c 50c
14" 12c | 50c 50c
15" 15c | xx xx
16" | 90c 90c
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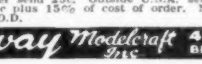

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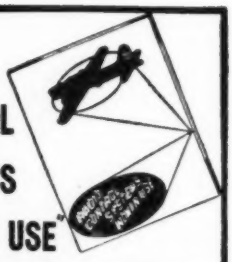

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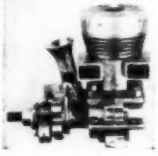

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Design Forum

(*Continued from page* 17)

moment at least, U-control has won out because it is most popular. What is the reason for this?

Before the war, free flight was predominant; now it is U-control. Possibly the explanation may lie in the disturbing effects of the war. During the war, nearly all expert free flight modelers were either in the fighting services or in the factories. Few were left home to carry on free flying or to train the modelers who were too young for war service. To prepare these youngsters for participation in aviation, the building of solid scale models was encouraged and—in fact a nationwide program was instituted in schools and clubs.

Nearly all the newcomers to model aviation were taught to build solid scale models. This type was selected particularly because solid scale replicas of various types of planes were required by the Army to teach airplane spotting, and partly because teachers, hurriedly recruited, knew very little about free flight models. Manual training teachers in schools could show a youngster how to carve out a solid scale model without possessing any knowledge of aerodynamics. In other words, building solid scale models was an expedient. Nevertheless it started the newcomers thinking in terms of this type of model and this particular type of construction. It gave them an interest in aviation without a comparable amount of knowledge about actual flight. When the war stopped many of these young men had reached the age when they wished to progress to the next step in model building.

Miniature gasoline engines caused widespread admiration, and it was the object of thousands of young men to own and operate one. When it came to putting one of these engines in an airplane, it was only natural that they should think of the craft in terms of solid scale models. Naturally they knew that this model had to fly, so it had to be comparatively light, have sufficient power and some means of control. It was not surprising, therefore, that U-control models resembling solid scale models in construction and having a convenient means of control through wires at one end and held by the young pilot at the other became popular overnight. Young model fliers who had been trained in solid scale construction could fly these U-control planes without knowledge of free flight aerodynamics. Today many say, "Why bother with free flight? We have plenty of fun and thrills with the U-control." Apparently, to them free flight aerodynamics presents a tremendous problem whose challenge for solution is not strong enough to divert their interest from U-control flying.

This does not mean that free flight flying has been discarded, because there are scientifically inclined young men to whom it is more important to solve problems in aerodynamics than to stand in the middle

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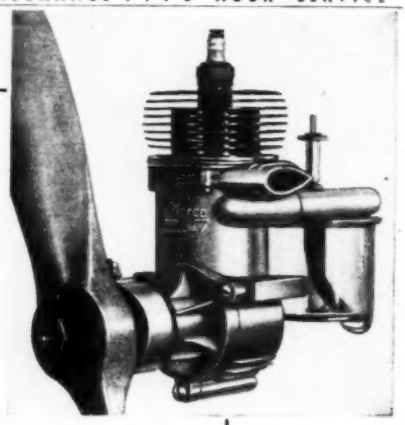

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of a circle and control a model with a twist of the wrist. They are the ones who will keep free flight flying alive regardless of the fact that they may have to travel many miles to some cleared and open flying space. To city boys this presents a real problem, but in the suburban or country districts modelers cannot use this as an excuse to fly U-control rather than free flight planes. We can look to the city boy to turn out superior U-control planes, and to those from the wide open spaces to produce the best free flight planes.

Actually, it is foolish to compare the two types of flights because each is in an entirely different field. U-control flying can be compared to motor car racing because it contains more characteristics of this sport than of model flying. In effect, it is a miniature motor car provided with wings so it will jump off the ground on the end of a wire. It may be expected that many U-control fliers will never build free flight airplanes but instead will turn to motor car racing.

What can be done to encourage free flight design and construction? As we noted, the war deprived youngsters of receiving training in the fundamentals of aerodynamics—as a result, it now seems too difficult for them to try to conquer the problem of stability and to build a free flight model that will perform successfully without crashing. Actually, it is quite a simple matter. All that is required is to follow a few basic rules that may be simply stated. It is not necessary to read complicated or involved textbooks. If you really wish to build a free flight model, look over the following rules and then try to apply them to some simple airplane, preferably a rubber-driven model. It is of course more dramatic to build and fly a gas model, but the chances of success with a gas job are small compared to a rubber model, if you have not had considerable free flight experience. So start with a simple model. A more complicated one can be built later. Remember, if a model is stable it will fly, at least to some degree. Efficiency alone improves the flight.

In designing a model for stability, the first consideration is the *wingspan*. 21" is excellent for an experimental model; it is large enough to provide steadiness in flight and yet not so large that construction will be complicated and lengthy. The wing chord (distance from leading edge to trailing edge) should never be less than 1/6 the wingspan and preferably 1/7 or more. For 21" span, a chord of 3" is appropriate. Fig. 1 shows these proportions and others to follow. The horizontal stabilizer should be placed back of the wing at a distance of at least 3 times the wing chord. If this distance is greater, the stability and steadiness in flight will be greater. However, when excessively large, a longer fuselage and consequently heavier construction is required. Thus we must compromise between increased stability and increased weight. When the tail moment arm is more than 4 times the wing chord, usually very little added stability results, while the weight increases greatly. These proportions refer to both rubber powered and gas models.

However, the stabilizer area of these two types differ. Rubber powered models require a stabilizer area 33% of the wing area or more, depending on the length of the nose or whether the plane has a landing gear. If the nose is longer than 1/2 the tail moment arm (M), then the stabilizer area should be proportionately larger, up to 50% of the wing area. In gas models, the stabilizer may be smaller because the powerplant has concentrated

weight and does not extend, like rubber-bands, the full length of the fuselage. So the area of gas model stabilizers may be as little as 25% of wing area. Any increase in area over this amount merely adds to the stability of the craft. Little weight is involved in larger stabilizers, so many present-day gas models have stabilizer area of 33% wing area.

The nose length of all types of airplanes has a great effect on stability; make the nose as short as possible. In rubber models, the nose is seldom shorter than 1/3 the tail moment arm, Fig. 3. In many models the nose length is equal to the moment arm, especially in stick models where no landing gear is used that might provide balance by weighting the nose. The balance in this case is produced by lengthening the nose, as in Fig. 2. Gas models have very short noses because the engine is heavy compared to weight of the structure. Consequently, the engine can be placed close to the center of lift, which is usually the center of the wing (Fig. 3). These proportions all have a bearing on longitudinal stability and tend to keep the plane on an even keel in an up and down direction. If it noses up sharply, the long moment arm, large stabilizer area and a short nose all tend to reduce the nosing-up effect and result in quick recovery.

Only one more point has a bearing on longitudinal stability: the angle between wing and stabilizer, called longitudinal dihedral. This should be approximately 2-1/2° and seldom less than 2°. An excellent setting is a 2-1/2° angle of incidence for the wing with the stabilizer set at 0° or parallel to thrust line (Fig. 4). Sometimes the wing is set at 3° and the stabilizer at —1/2°. Such a setting tends to reduce stalling under power and to create a flatter glide with power off. The closer the stabilizer is placed to the wing, the smaller the longitudinal dihedral should be. In other words, if the stabilizer is close to the wing and the angle between wing and tail is large, it will cause a large nosing-up effect with power on. With any change in speed, the plane will nose up sharply. To overcome this, the angle must be reduced or the stabilizer placed farther from the wing.

The problem of lateral stability is easily taken care of by constructing your wing with a dihedral angle, (Fig. 5). This angle is created by "creasing" the wing at the center and raising the tips. Sometimes the wing is "creased" in more than one place, as in Fig. 5-B. This is called a polyhedral wing and provides great stability. In both cases, each wingtip should be raised approximately 1" for every foot of span. That is, if the wingspan is 21" the tips should be raised 1-3/4" above the center point on the wing uppersurface, as indicated in the figure. Models built with less dihedral are more efficient, but their stability is usually reduced.

Though directional dihedral is important, it is not given the necessary consideration. This is controlled by the size of the fin or vertical tail surface. An excellent rule is: make the fin area 12% of the wing area on rubber models, 6% on gas models. The fin area required varies with the amount of side area in the front part of the airplane. If the airplane has little side area and small dihedral, the fin area should be smaller than the amounts given above. If dihedral and side area at the front is excessive, then more fin area should be used. Side area is often produced by large pylons or deep fuselages and is an advantage because it prevents the nose from dropping and the whole

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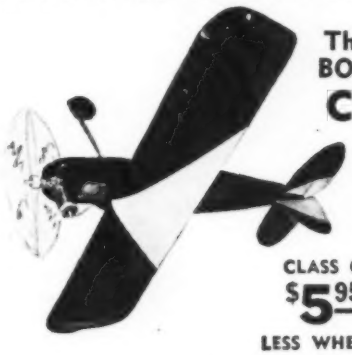

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airplane from nosing toward the ground when it banks steeply. Dihedral and side area at the front tend to hold up the nose until the airplane has rolled back into level flight under the corrective action of the wing dihedral.

This is important in spiral stability. Some model builders believe mistakenly that spiral stability can be corrected solely by adjusting the size of the fin. Size of the fin does help correct this condition, and in certain types of flight will prevent spiral instability, but it never does a complete job. To have a plane completely stable in a spiral sense—that is stable in level flight as well as climbing flight—the center of lateral area (CLA in Fig. 3) must be on a level with or slightly below a line drawn through the center of gravity (CG) parallel with thrust line.

This CLA is the center of side area of the airplane and may be found by cutting out a silhouette of the airplane from cardboard and balancing it on the point of a pin. The point of balance is the CLA. In such a case, it has two upturned tips forming vertical projections. CLA represents the point at which the side forces act when the airplane starts to turn. With the CLA in the position shown, banking is reduced to a minimum when the plane circles. Consequently, the tendency to drop the nose with a possible resulting spiral is small, and it has been definitely shown over a period of some ten years that airplanes with the CLA in this position are steadier and more stable in flight than airplanes with the CLA above the point shown. In many cases airplanes have been flown with the CLA high, but other means, such as a low line of thrust, were used to keep the nose continually pointed up so that any spiraling tendency would result in a spiral climb instead of a spiral dive. Briefly, a high CLA produces a spiral tendency, either to climb or dive—a low CLA produces steadiness.

The position of the line of thrust is also important. This should be comparatively high above the CG, as shown in Fig. 3, and not below it as in Fig. 6. When it is below the CG the tendency to stall is increased as the plane noses upward. It is an advantage to have this condition reversed; that is, as the plane noses up the tendency to stall should be reduced. The high line of thrust accomplishes this because it tends to nose the plane down, whereas the low line of thrust tends to nose it up.

The only remaining consideration is balance of the airplane. If you design your plane with the features described above and balance it correctly, you should have a perfect flight each time. Correct balance results from setting the wing at the proper angle of incidence, namely 2-1/2°, and the stabilizer at the correct angle, 0°, with CG at a point back of the leading edge approximately 35% of the wing chord. With these settings and with wings and surfaces properly aligned and not warped, your plane should fly consistently.

After you have mastered free flight flying, you will find that combining it with U-control will provide you with an interesting and convenient means of testing new types of airplanes. You may have an airplane that will fly perfectly in free flight, but it may be a scale model, a prototype of a large full scale airplane to be built and flown. You are anxious to know how this plane will respond to controls, whether it will be as stable when reacting to controls as in free normal flight.

If you attach control lines to such an airplane *without fastening wing guides to these lines,* your airplane will react freely in U-control flight and, at the same time, you will be able to move the controls and determine their effect. In such case, be sure not to attach the wings to the wires in any way. Such fastening holds the airplane steady and prevents normal stability reactions from taking place. Thus you cannot be sure whether your airplane is stable or not.

We suggest that you write to us and present any questions you may have on this matter. Hereafter, we will print answers in each issue to questions you send in. Don't forget, also, to send in your new ideas for the design of models of full scale airplanes so that we can publish and discuss them in future issues.

What Will the New Rules Be?

(*Continued from page* 25)

anything up, we have seen enough of the tilting tail type of stab lately to know that it is fairly effective, once the effect has been adjusted to control the ship precisely as desired. This rather complex interrelation of rules is certainly necessary if wing loadings go out the window.

Suppose that wing loadings are out. And suppose you thought in terms of wing increases only, banking on the increased weight of the structure to help bring up the power loadings as required. How much wing would you want to use? As a starter, let's think back to the theoretical *Ohlsson 60* ship in which, simply by holding to the proposed power loading of 120 oz. and the old wing loading of 7 oz. per 100, we found that we had an increase of some 300 sq. in., or over 40% increase in area. If we arbitrarily add another increase of 300 sq. in. we will have increased the original wing area by over 80%, thus practically doubling it. This should be an extreme example, if such rules were passed. Yet the illustration comparing this Dream Ship (should we have said Nightmare?) with other designs discussed shows it to be a reasonable airplane.

And then there is the business of perpetually trying to cut down performance and ending up every time with a model that outperforms anything ever seen before. All such suggestions as landing gear and crossection elimination, or the removal of wing loading, tend to boost performance, not cut it down. What do we want? The main reason for knocking off the landing gear (oh yes, we have heard about grass and wind) is that we have forgotten how to hang wheels on an airplane so that it is possible for it to get off. Mouse trap landing gears, or single-wheel affairs with flimsy wire don't enhance takeoff characteristics.

In our opinion an increase in power loading is a step in the right direction. Skill in design will be more at a premium. If crossection and wing loading are left alone, the manufacturers won't be hurt (at a time when they can ill afford any more trouble), and the kid down the block can put that *Madewell* in a *Bombshell* and give you some competition, without being bludgeoned by a *Pencil Bomber*. Other steps may have to be taken as time goes by.

But if crossection and landing gears both go, and the typical gassie becomes a glorified stick model, then we ourselves are going to forget the contest free flight and go in for U-control. Free-flight, except for sport, will be for the birds!

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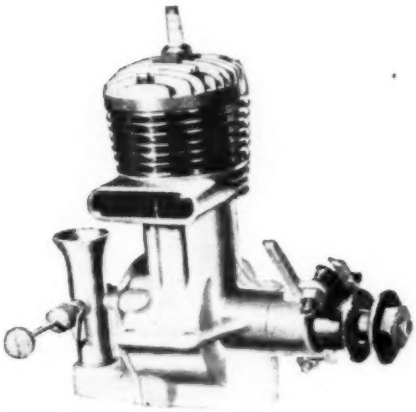

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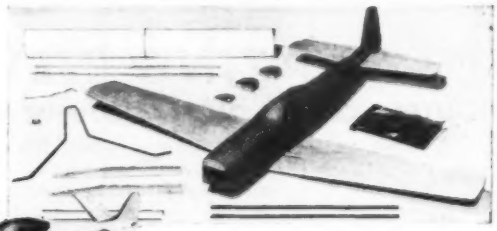

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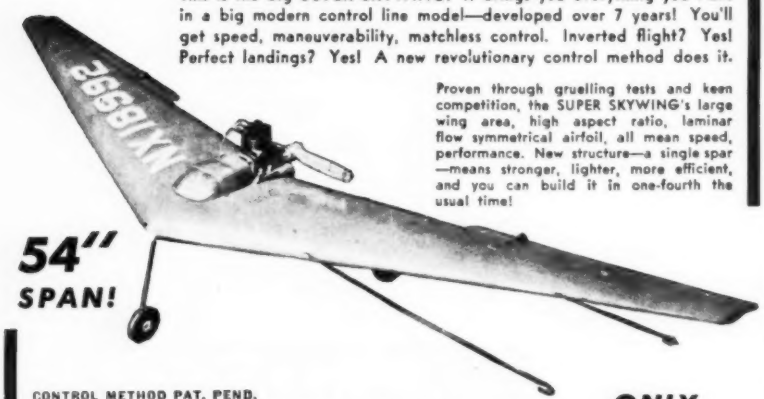

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Flash

(*Continued from page 2*)

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ALTHOUGH NATIONAL AIR Race results are given elsewhere in this issue, numerous facts that have come to light in the past few weeks are of considerable interest. United Aircraft has not only freely admitted but actually publicized the fact that all its subsidiaries worked long and hard in preparation of Cook Cleland's Thompson Trophy-winning Goodyear F2G-1 Corsair. Pratt & Whitney worked on engine, Hamilton Standard on propeller, Vought on the airplane—several million dollars worth of scientific talent on a single entrant! Allison makes no bones of the fact that its service and factory representatives gave freely and fully of their services on the Allison engines in the race (Lockheed P-38 *Lightnings*, North American P-51 *Mustangs*, Bell P-39 *Airacobra* and Bell P-63 *Kingcobras*. Lockheed spared no expense in maintenance, modification and servicing of its chief test pilot Tony LeVier's crimson P-38 *Lightning*, and Ranger engine division of Fairchild modified one of the North American AT-6 entered in Halle Trophy Race (the other Ranger-powered version was also Ranger-modified but under AAF contract during the war). These revelations place an entirely different complexion on the races than prevailed in pre-War years (where sponsorship was confined to gasoline and oil and such minor items as piston rings and oil cleaning filters). The contrast between the brains, experience and facilities of United Aircraft, Allison and Lockheed arrayed against such oldtime "backyard" enthusiasts as Steve Whitman (who flew a surplus *Kingcobra*) seems a little appalling and grossly unfair. Current cry among the oldtimers is: "Let the mighty industry hold its own races and let us hold ours—but don't mix 'em!" . . . and with that we'll heartily agree.

AND SPEAKING OF the races, our older readers will be delighted to hear that Ben O. Howard, famous "Benny" of the "Ike" and "Mike" days (not to mention "Pete" and "Mr. Mulligan") has climbed far up the ladder as "aviation specialist" for Atlas Corp. This firm is directed by Floyd B. Odlum, husband of Jacqueline Cochran, also a renowned racing pilot. But more important is the fact that Odlum just about owns Consolidated Vultee, which indicates that Howard is slated for a major executive assignment (actually management) of Convair. "Benny's" career since the "Mr. Mulligan" crash has included manufacture of a commercial version of that airplane, special assistant to Donald Douglas and various other "consultant" activities.

THE PROBLEM of jet intake icing is being studied closely by the Navy with actual simulated tests on the sleek McDonnell FD-1 *Phantom* fighter. (Future McDonnell Naval aircraft will bear designation "H" to avoid confusion with Douglas aircraft.) One of the squat fighters is now being installed atop Mt. Washington, 6,288 ft. peak in New Hampshire where high winds, cold weather, snow and ice abound. The plane is mounted in a hangar open at both ends to form a natural wind tunnel. Navy engineers hope to determine whether the *Phantom's* wing or jet intake ices up first, thereby providing data for new pilot instructions for the airplane. For example, if the wings ice up first the pilot will know that his engines are safe for a short while when he first notices ice on the wings.

THE HELICOPTER has now been officially recognized by the Civil Aeronautics Board through its specific inclusion in new regulations. Whereas fixed wing aircraft may not fly below 500 ft. at any time, and 1000 ft. over congested areas, the helicopter may fly at any altitude at any time provided of course the pilot exercises proper caution. Helicopters are also now legally authorized to fly at night under contact

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CONVAIR HAS COMPLETED its "manufacturer's demonstration" phase of flight tests on the needle-nosed XB-46 jet bomber and officially delivered the giant plane to Army test pilots at Muroc Army Air Base. Air Force still refuses comment on prospects for procurement on the sleek craft but funds for fiscal 1948 carry no provisions for the type. Fiscal '49 funds, now being prepared jointly with the War Department, may however include a photo-reconnaissance version of the XB-46.

NORTHROP AIRCRAFT'S YB-49 has been completed and is now undergoing ground taxi tests. The slim flying wing is an all-jet version of the well known XB-35 powered by *eight* J-35 turbojet engines, a total of 32,000 lbs. of thrust. Engineers are confident this is the "bomber to beat" in the race for Air Force favor during coming months. With speed to burn and a remarkable bomb load and long range, it appears the answer to long range fast hitting power. Northrop's XP-89 "all weather" fighter is scheduled to fly this fall and observers also agree that "J.K." has done it again. Not a flying wing, the new craft is of conventional layout but jet powered.

ARGENTINA'S JET FIGHTER — the "Pulque," or "arrow"—is a valiant and somewhat illuminating attempt at jet propulsion below the border, the first non-U.S. jet aircraft in Western Hemisphere of native design and construction. Of straightforward and simple lines with comparatively poor native workmanship, the "Pulque" nevertheless indicates the energy and ambition of the Argentine in its desire for native progress. The engine is a British Rolls-Royce *Derwent* of 3600 lbs. thrust. Span is 36 ft. 11 in., length 31 ft. 10 in., and weight 7900 lbs. It has been successfully test flown and will be produced in the government aircraft factory at Cordoba.

THE FOUR PLACE *Ercoupe* has been completed but plans for its future are insecure at the moment. Fred Weick, designer and two-control pioneer, believes it is a logical development of the highly successful two place *Ercoupe* which it resembles a great deal. Numerous sub-assemblies from the two place model are utilized with accompanying saving in tooling and production costs.

FLASH ENTHUSIASM for the "Channel Wing" principle being fostered by Willard R. Custer, Hagerstown, Md. inventor, is being dampened by more sober analysis. Bone of contention is not "will it fly" (it already has flown for about 100 hours!) but "is it *better* than conventional aircraft?" Although it takes off at only 15 mph (lands and flies at about the same slow speed), engineers believe the old familiar Piper *Cub*, never noted for performance, does a more efficient job. The lowly but faithful *Cub* lifts about 18 lbs. for each hp of its engine, whereas the "Channel Wing" can hoist only 11. This means that the *Cub* will lift over 60% more on each gallon of gas (or 1c of expenditure) than the highly touted "Wing." But the *Cub* doesn't land at 15 mph nor can it raise itself vertically as the Custer design will do theoretically. However, the *Cub can* be gotten down safely with a dead engine! There is still some doubt that the "Channel Wing" ship can do the same.

WHILE THE Truman-Evans duo of Piper *Cub* pilots continue to astonish the flying world with their steady progress around the world, two New York City pilots plan a *non-stop* round-the-world flight in a *Cub*! Mid-air refueling would be used and the landing gear would be dropped after the takeoff with a belly landing at the end of the flight. Cruising at 110 mph (the extra 10 mph being a bonus from the landing gear drop), the 100 hp Lycoming would have to keep running for 200 hours to complete the circuit along the route planned. Ted Thompson and Nelson Brown are completing plans for a 1948 takeoff.

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Lockheed Saturn

(*Continued from page 9*)

with a draftsman's triangle. Do not install any stringers until you remove the structure and have installed the other half bulkheads. When adding the 3/32" sq. stringers be sure to install the corresponding stringer on the other side of the fuselage to prevent pulling the fuselage out of line. Carve the nose block from very light balsa and hollow as shown in plans. The cockpit is cut to shape from light 1/32" sheet and cemented in place. Note the 1/16" sheet fill-in between stabilizer and stringer.

The engine nacelles may now be carved. Use the lightest balsa blocks obtainable for this structure. Two nacelles are required. The outline of the blocks are shown in the graphs. Shape the blocks to this outline, then carve to a circular crossection. Note that the section under the wing is flat for a smooth contact. After nacelle is sanded, split down the center and carve the interior out to about a 3/32" wall thickness, except near the nose, where the nacelle bulkhead must be installed. Be sure to leave the opening in the rear for passage of the rubber motor to the stabilizer. Now cement the halves together and install the bulkhead with several coats of cement.

Bend the landing gear to shape shown. Dimensions may be obtained from the side view. Note that we employ dual wheels same as the "big job" does. The two struts are bound together with thread and cemented. The axle is held in place with a drop of solder. Use balsa wheels as they are so light. A drop of cement will hold the wheels in place. Bend the front landing gear strut to shape shown from .040 and cement it well into the nose block.

The tail surfaces are simple to construct. The rudder is flat in crossection and can be built directly on the plans. Ribs and spar are 1/16" by 1/8" and the outline is cut from medium 1/8" sheet. The stabilizer is built in same manner as the rudder. Note that the stabilizer is built in one piece and the ribs and spar are all 1/8" sq. balsa. Observe how 1/8" sq. soft strips are used over the ribs to create a "lifting" airfoil. If your model is on the heavy side you may add some 1/16" sq. crossbraces in the stabilizer as it must take the load of the fully wound motor. Do not assemble any of the major parts until they are covered.

The wing may be constructed directly over the plans. Be careful to avoid any warps. When the cement has set install the 1-1/2" dihedral under each wingtip. Apply several coats of cement at this joint.

Before applying the colored tissue, run over the entire framework with light sandpaper to remove any ridges or bumps that may mar the covering. Since the fuselage is quite symmetrical and has straight lines it may be covered with rather large sections of tissue. Smaller pieces will be needed as you approach the tail section. Cover the rest of the structure with the grain of the tissue running parallel to the long dimension of the structure to be covered. Bend the rear hooks from .040, force them into the leading edge of the stabilizer, and apply several coats of cement.

Cement the wing in the fuselage notch provided for it and align. Now cement the stabilizer and rudder in place. Small tissue fillets may be doped in place but these are not necessary. Cement the two engine nacelles carefully in place, making sure the alignment is the same. If thrust lines are out of alignment it will create a spiral effect. The nacelles are covered with small pieces of tissue.

The model is now sprayed lightly with water to shrink the covering. When dry, apply two coats of thin clear dope over the covering. All details such as windows, door outlines and control surface outlines are cut from black tissue and doped directly onto the covering. License numbers and identification are decals. Cover the cockpit windows with celluloid.

Select two medium light balsa blocks for the propellers. First blank the blocks out as shown in the plans. Remember that we use a right and a left handed prop with this model. Carve about 1/16" undercamber into each blade and keep the thickness to about 3/16" at the hub and taper to 1/16" at the tips. If much outdoor flying is anticipated, free-wheeling devices may be installed. Prop shafts are bent from .040 steel wire, slipped through the hardwood nose plug and ball bearing washers, then into the propellers. Give the finished props one coat of wood filler, sand lightly with fine sandpaper and brush on one coat of black dope and allow to dry. Prop tips are painted a bright yellow as seen in the photos.

The average model will require six strands of 1/8" flat brown (T-56) for each motor. Each motor has about 1-1/2" slack and is held to the rear hook by an S hook bent from .040 wire.

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with the aid of a third helper you can use two drill winders, each person winding a motor and both finishing simultaneously. Lastly, you can wind one motor, hook it on to the rear hook, then proceed to wind the second motor. Using a good rubber lube, each six strand motor should take 625 turns, which is more than enough to get your model "up thar".

If possible conduct the first test flights indoors (in an Armory); if not, choose a calm day for this critical period. First glide the model after ascertaining it is in approximate balance. You may bend the elevators down slightly to compensate for any slight stalling tendency. The turn may be either left or right as there is no torque effect. Warp the rudder to achieve about a 50 foot circle. . . . Good luck!

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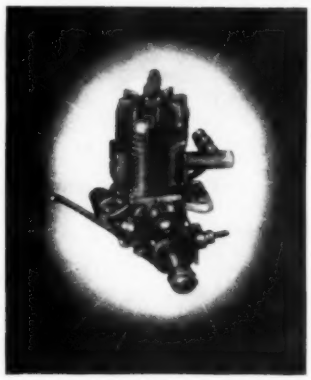

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